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ARIZONA MEDICINE
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Original ARTICLES

PRIMARY MEGACOLON

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Megacolon has been recognized as a clinical entity for over a hundred years. The literature on this subject is voluminous, much of it controversial. In spite of a large literature, primary megacolon is still a rather rare disease. One-quarter of the cases develop before the age of five. It is three times more common in males than in females. The first report of primary megacolon is credited to Perry(29) in 1925. The second report was made by Billard( ) in 1829. The disease is attached to Hirschsprung's(18) name who described this condition in 1888. His report consisted of two cases. The first child died of a progressive cachexia at the age of eleven months, and the second one at the age of seven months with multiple ulcerations of the colon. Hirschsprung (19) later added two additional cases. Bockus (8) defines primary megacolon as a great dilatation, elongation from hypertrophy of the sigmoid colon, involving at times the entire colon and rectum, associated with a retention of an enormous amount of feces and an absent defecation reflex, due to a neuro-muscular derangement of the colonic function, usually congenital in origin. Since the original description of this disease, nearly every known cause of colonic malfunction has been postulated as being the etiological factor of this disease. The following outline, which is modified after Bockus (8), presents the most widely accepted causes of primary megacolon.

ETIOLOGY OF PRIMARY MEGACOLON

MECHANICAL CAUSES (USUALLY DEVELOPMENTAL)

1. Extreme mobility of sigmoid (mesosigmoid too long) resultin torsion. (Barth)
   Increased length of colon, particularly of sigmoid loop. (Marfan)
2. Mucosa of sigmoid thrown into valve-like folds as a result of redundancy. (Perthes, Roser)
3. Kinking, angulation, or adhesions at rectosigmoid. (Treves)
4. Over-development of sphincteric structure at rectosigmoid, or spasm of sphincter at the rectosigmoid. (Goebel)
5. Aplasia of musculature of rectosigmoid. Concetti)
6. Drag of a sigmoid overloaded with meconium acting as a valve.
7. Partial atresia of anal canal, rectum, or sigmoid.
8. Spasm of anal sphincter due to fissure, ulcer, or other cause. (Fenwick, Kastner, Bensaude, Hurst)

INFLAMMATORY CAUSES

1. Infective or inflammatory process involving the colon primarily. (Walker and Griffiths)

DERANGED NERVOUS MECHANISM

1. Abnormality in sympathetic innervation of longitudinal muscle fibers of colon. (Formad)
2. Neuromuscular segmental defect in colon or paraysis of a gut segment. (Hawkins)
3. Hyperactivity of sympathetic innervation of distal colon, relief by lumbar sympathetic,

ramisectomy. (Wade and Royal)

4. Hypoactivity of sacral parasympathetic innervation to distal colon.
   a. Anal achalasia (Hurst, Wade, Lehmann, Gask, Ross and Fraser)
   b. Achalasia of musculature at rectosigmoid. (Martin and Burden)
   c. Degenerative changes in Auerbach's plexus-(Cameron and Kernohan)
   d. Disease of sacral autonomic fibers (Ishikawa).
   e. Vitamin B_1 deficiency as cause of achalasia (Etzel).
   f. Lack of propulsive motility of distal colon.
   g. Abnormality in form or numbers of cells of myenteric plexia (Dalla Valle, Robertson and Kernoian, Tiffin Chandler and Faber, Zuelzer and Wilson).

During recent years the students of this disease have suggested theories that some type of deficiency of the nerve supply of the bowel is responsible for primary megacolon.(10,30,38,43). These theories are supported by adequate microscopic pathological findings. Beginning with the work of Dalla Valle(10) in 1920, and supported by the findings of other workers, the myenteric plexuses have been found to be at fault. In many cases there has been an agenesia and in others there is a marked diminution in the number of ganglion cells of the myenteric plexuses. In the normal colon the myenteric plexus forms a fairly continuous sheet between the two layers of muscle. The area of dyskinesia in the myenteric plexus is almost absent. In two of our cases no myenteric plexuses occurred in the area of dyskinesia. In the photomicrographs accompanying the article, Figure Number One shows the presence of myenteric plexus This section was removed about 12 cm. above the dyskinetic section. Myenteric plexuses are present in this slide. The second slide, Figure Number Two, taken at the area of dyskinesia shows a complete absence of nerve or myenteric plexus cells. The myenteric plexuses, or the plexuses of Auerbach and Miessner, are the terminal ganglia of the sympathetic nervous system. Sympathetic ganglia(2) arrive from sells of the ganglion crest and the neural tube, which at 10 mm. migrate distally along the nerve roots and accumulate in the masses of the dorsal lateral to the aorta. In the region of the trunk these paired segmental clusters unite from segment to segment to form a

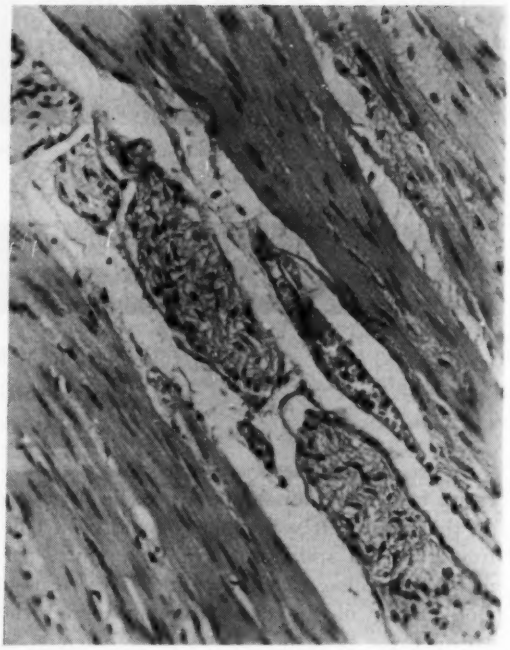

FIGURE 1 A.
X 1000. Showing myenteric plexus fibers normal in structure and amount taken 12 cm. above area of dyskinesia.

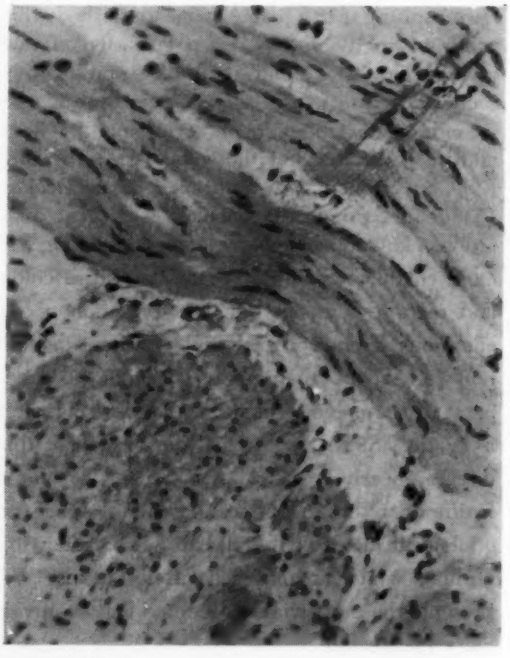

FIGURE 1 B.
X 1000. Taken through area of dyskinesia of same case shows an absence of all nerve elements.

longitudinal cord and are converted into nerve fibers, thereafter linking the ganglia in a commissural manner. The resultant ganglionated cords are the sympathetic trunks. In addition to the primary gangia of the paired sympathetic trunks, there are other more peripheral ones, known as collateral ganglia belonging to the great prevertebral plexuses such as the cardiac, coeliac and hypogastric. Still further distally are the terminal ganglia located near or even within the structures they innervate. This is the group that includes the coeliac and the cardiac ganglia as well as the ganglion masses of the myenteric and submucous plexuses. It is readily seen many areas exist where arrest or maldevelopment of the plexuses may occur. The pathological physiology of primary megacolon was demonstrated very adequately by Swenson(37), Rhinelander and Diamond, by the use of ink-writing kinematographs with ballons on the ends of their catheters. These workers demonstrated that the propulsive effort in the recto-sigmoid area, or the area of dyskinesia, was flat or absent compared to the descending or transverse colon in patients suffering with primary megacolon. In their control cases, children who had colostomies for other various reasons exclusive of megacolon, the peristalic propulsive effort was seen in all three areas studied.

Severe constipation and obstipation are the presenting complaints. Distention, audible and visible peristalsis, cramps and vomiting occur in varying degrees. Large fecal impactions are frequently present in the left side of the colon, whereas the rectal ampulla always remains empty. Hirschsprung(18) commented specifically on this finging in his paper. The signs and symptoms of primary megacolon are those which ordinarily follow low, chronic, partial colonic obstruction. If the patient presents a pot-belly statue, a diagnosis of this disease is usually established by means of x-ray study. However, a special technique(36) must be used. The technique recommended consists of a slow instillation of barium enema under fluoroscopic observation until the lowest portion of the dilated bowel can be seen. The flow of barium is then stopped and the bowel manipulated through the abdominal wall with the patient under the fluoroscope. The area of spasm can then be demonstrated without being obscurred by the overlying filled and dilated sigmoid. By this method the picture of a functional obstruction produced by dyskinesia of the rectum or recto-sigmoid can usually be seen. The barium must be allowed to enter slowly and in small quantities. It is essential to examine the patient in the oblique projection because if this is not done the appearance produced is that which is so familiar in much of the literature, a colon which appears dilated to the anus. However, with the oblique projection a portion of the rectum or the recto-sigmoid up to 10 cm. in length can be visualized and is consistently less than normal in character. Contour is frequently irregular and often turbulent and purposeless peristalic activity may be seen. Occasionally there may be reversed peristalsis so that the barium may be carried sephalad into the sigmoid, but more frequently no peristalic activity can be seen.

As in all controversial subjects there is a considerable difference of opinion as to the treatment of primary megacolon. The methods of therapy employed at the present time may be divided into three groupings: (1) Attempt sto control the disease by medical management; (20, 22, 24). (2) Surgical treatment consisting of resection of all or parts of the dilated and hypertrophied colon;(4, 7, 9, 12, 13, 16, 17, 23, 26, 35, 36, 37). (3) Section of the sympathetic pathways to all or part of the colon.(1, 5, 14, 28, 32, 33). The medical treatment consists of special diets, laxatives and enemas, and various drugs that influence intestinal motility. Success has been reported with such drugs as Mecholyl Bromide, which tends to increase intestinal peristalsis. Equally good reports have been reported with Syntropan. These drugs presumably have opposite effects; the former being a parasympathomimetic and the latter a parasympathetic depressant drug. Mild cases of primary megacolon may be controlled medically for a long period of time, but in a severe form these measures always fail. The method of surgical management has been stated above consists of the resection of all of the dilated and hypertrophied bowel or parts thereof. This procedure is based on the theory that the seat of the disease is the enlarged portion of the colon. Resection in these cases is always followed by a recurrence proximal to the line of resection. A total colectomy with an ileo-sigmoidostomy is advocated by many surgeons, even though only a portion of the colon seems to be involved.

However, after the removal of the entire colon, the ileum has been seen to undergo dilatation and a hypertrophy with a recurrence of the symptoms. The other surgical approach to the treatment of primary megacolon is a treatment of surgical interruption of the parasympathetic pathways to all or part of the colon. This approach is originally described by Wade and Royal(40). Scott and Morton(32) in 1930 describe dthe effect of spinal anesthesia on patients with megacolon. Many workers believe that evacuation following the use of spinal anesthesia is an indication for lumbar sympathectomy(31). It is obvious however, that a sympathectomy does not reproduce a physiological effect of spinal anesthesia. Unilateral or bilateral lumbar sympathectomy, presacral, periaortic and inferior mesenteric chain resections have all been tried combined with splanchnicectomy. The follow up on these cases in which this type of operation has been used has demonstrated that the results are far from satisfactory. In 1948 Swenson(35) and his co-workers presented evidence supporting their contention that primary megacolon was due to the malfunction of the rectal sigmoid that results in partial colonic obstruction. This obstruction accounts for the dilatation and hypertrophy of the colon which retains its peristalic function. Swenson and Bill (35) devised an operation which has been used by them some 35 times with a high degree of success. The technique is here described:

TECHNIQUE OF THE PULL-THROUGH OPERATION

The first part of the operation is performed the same as the combined abdominal perineal resection. The sigmoid and rectum are freed from all attachments in the pelvis down to the levator ani muscle. The bowel is then divided proximal to the abnormal portion and both ends are closed with a continuous catgut suture. The distal end is then pulled out through the anus. The mucosal surface which is now presenting and the peritoneum are then carefully scrubbed and prepared with mercresin scrubs. Drapes are placed and the bowel is opened transversally 2½ cm. from the anal skin margin and the proximay bowel is then pulled down through this opening. The anastomosis is made, using first a row of black cotton Lembert sutures through the muscular coats of the two segments of the bowel. Up to this point the procedure has been relatively aseptic. The proximal bowel is then opened and the mucosa of the two ends are approximated with continuous chromic catgut suture. The anastomosed bowel is then pushed back through the anus and the suture line assumes a position of about 2½ cm. above the anal skin margin. The abdomen is then closed in layers.

Figure Number Two illustrates the various steps in the pull-through operation.

Swenson(37) reported the use of this technique in 34 patients, with one post-operative death and what appears to be a complete cure in the remaining 33 patients.

Our series consists of only 9 cases and reflect the results of Swenson's(37) work. It is true that the oldest case is four years post-operative and the balance less, perhaps too soon to accurately evaluate the results. However, these children seem to be normal.

FIGURE. 2. Essential Steps of Pull-Through Operation. A. Bowel is delivered and clamps applied well above area of dyskinesia.

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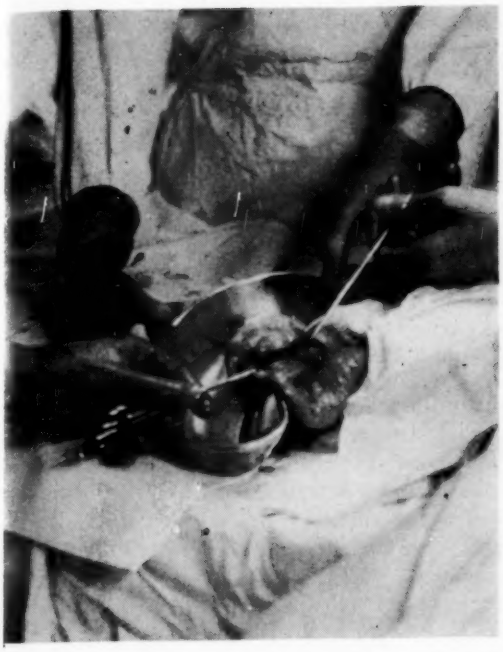
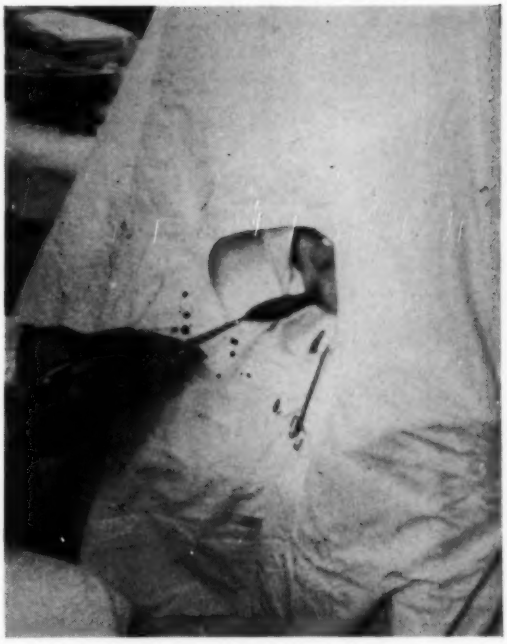


B. Bowel transected for emptying of impacted contents.



D. The distal segment is drawn through the anus. The mucous membrane is now on the outer surface of the bowel.

C. Distal and proximal ends closed with sutures. Note the difference in size. The smaller end represents the area of dyskinesia.

E. The distal segment is being opened.

F. The proximal segment is being drawn through the opening in the distal segment.

H. Anastomotic line being replaced in anus.

G. Anastomosis is completed. Patency being checked.

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HYPERVITAMINOSIS A
Study Of An Unusual Case

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Increasing attention is now being paid to the syndrome of hypervitaminosis A, which was first described clinically in 1944.(1) The following case is reported because it differs in a number of aspects from any case previously described in the literature, and will contribute more information on the varying clinical facets which this syndrome may present.

REPORT OF A CASE

N. S., an 8 year old white male, was first seen on March 25, 1950, for a routine check-up. It was felt that the patient had endured more than a normal number of upper respiratory infections. His past history was not remarkable.

Examination at that time was essentially normal except for hypertrophied tonsils. The patients was referred to an otolaryngologist, and a tonsillectomy performed in April, 1950. Recovery was uneventful.

The patient was next seen on July 28, 1951, at which time the presenting complaints were pains in the calves and thighs, and a mild skin rash of one month's duration. The leg pains had actually been present since infancy and occurred mostly after arduous exercise, or at night when the boy first laid down before going to sleep. They seemed to have increased in frequency in recent months. The skin rash consisted of scattered, discrete, macular lesions on the face, neck, and interscapular area which were quite pruritic.

Physical examination at this time was not remarkable except for: (1) the skin lesions as described above which were excoriated; (2) a faint aortic systotic murmur heard only in the upright potion and more prominently on expiration; (3) a palpable non-tender liver distinctly enlarged 2 finger breadths below the right costal margin. The hepatomegaly had not been present in March, 1950.

The child's mother, a registered nurse, was questioned concerning the boy's ingestion of medication. He had received ten drops of Oleumpercomorph(R) daily until the age of one year, then 1 teaspoon of Homicebrin(R) daily until 4 years of age, and one Vigraine(R) capsule daily until one year previously. At this time his mother decided that he needed more vitamins, and on her own initiative commenced administering Theragran(R) capsules twice daily. If he seems a bit more listless than usual, he would receive one or two additional Theragran(R) capsules that day. Each Theragran(R) capusule contains 25,000 units of Vitamin A; thus 50,000 to 100,000 units of Vitamin A were administered daily for a period of one year. In addition the boy consumed quite a bit of milk, butter and green or yellow vegetables.

Radiological examination of the pelvis, forearm, femurs, tibiae, and fibulae were normal.

Laboratory Data: On August 3rd the red blood count was 4.5 millions per cubic millimeter the hemoglobin was 11.5 gm. %; the white blood count was 6,000 per cu. m.m., differential count was segmenters 31%, lymphoctyes 65%, monocytes 2%, and eosinophiles 2%; the Urinalysis was normal.

Liver profile studies were performed on August 2nd, 3rd, and 6th showing the following results: the bromsulfalein test, no dye was retained; the cephalin flocculation was 0, and 1 plus in 48 hours (within normal limits for this laboratory); the thymol turbidity showed 1.2 units; the prothrombin time was 15 seconds and 100% of normal; the Wintrobe sedimentation

rate was 8 mm. in 1 hour; a direct Vandenbergh was negative; the indirect Vandenbergh –0.1 mg. bilirubin/100cc; the serum cholesterol was 245 mg. %; the total protein was 5.61 gm. % with serum algumin 3.16 gm. % and the serum globulin was 2.45 gm. %; the A/G Ratio was 1.3:1; the icterus index was 10 units; and the lipochrome index was 5 units.

Clinical Course—The blood serum was carrot-colored. The Theragran(R) capsules were disocntinued on August 6th, and on August 11th a fasting Vitamin A blood level was 124 mcg %.** He was then placed on a Vitamin A-free and low carotene diet. On August 28th, a Vitamin A toleranc etest was performed. His fasting Blood Vitamin A level had by this time fallen to 31 mcg. %. After a test dose of 75,000 units of Vitamin A acetate was administered by mouth, his blood level at three hours was 57.5 mcg %, at 6 hours 80 mcg %, and at 9 hours it was 40 mcg %.***

On September 12th, his liver had receded in size until it was palpable only one half finger breadth below the costal margin, and the excoriated skin lesions had rapidly disappeared without specific treatment. He was free of these lesions for the first time in two months. The myalgia of his thighs persisted unchanged, however, and probably has no relationship to hypervitaminosis A.

COMMENT

At the time of preparation of this report only 17 cases had been reported in American literature to my knowledge. This case is distinctive in a number of respects:

1. AGE.—All previous reported cases have occurred in infants or young children (the oldest being 37 months), with the exception of a 44

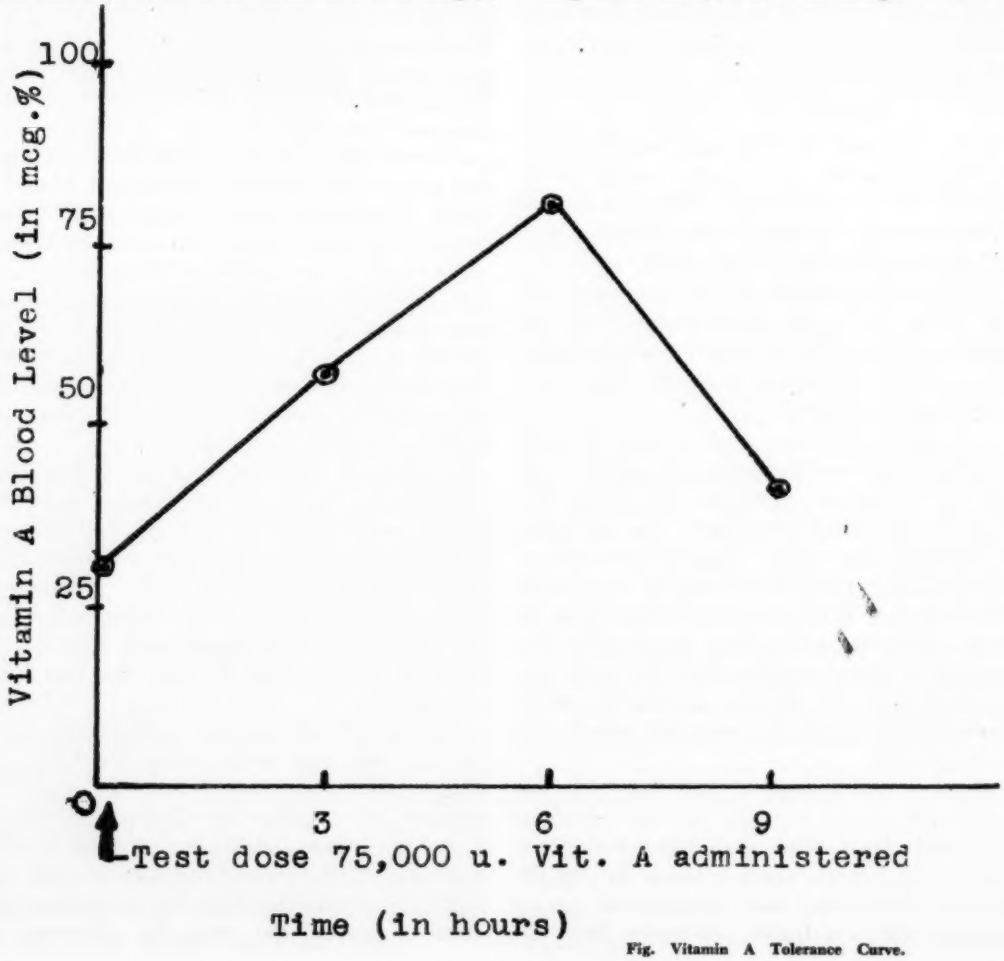

Fig. Vitamin A Tolerance Curve.

year old woman reported by Sulzberger and Lazar.(2) This is the first instance reported in an older child.

2. DOSAGE.—The daily dosage of Vitamin A administered in this case is more moderate than that reported in most cases, probably averaging no more than 100,000 units daily (plus a moderate amount of ingested carotenes). The daily dosage in most other reports averaged 200,000 to 600,000 or more units of Vitamin A daily.

3. SKELETAL CHANGES.—Like the case of Sulzberger and Lazar(2) in the adult, this boy exhibited no abnormal roetgenological findings. This is in contrast to the other cases, wherein cortical exostoses and periostitis were almost always found. This is probably due to the fact that the more mature stage of bone growth in the older child makes the skeleton less susceptible to toxis stimulation by excessive amounts of Vitamin A than that of an infant or a young child. In this respect an analogy might be drawn to the far less drastic skeletal changes seen in the older child than in the young children in the hypovitaminoses—scurvy and rickets. The more moderate Vitamin A dosage in this case might also be a factor.

4. CAROTENEMIA.—This boy had both hypervitaminosis A and moderate carotenemia. The carotenemia is of no significance clinically, for moderate carotenemia produces no symptomatology.(1) Some of the previously reported cases of hypervitaminosis A have exhibited carotenemia, but a number have not.(3)

5. HEPATOMEGALY.—As in the majority of cases which have been reported, hepatomegaly was a prominent finding in this case. This is noteworthy because hepatomegaly was not present in the adult case mentioned above.(2) The enlarged liver rapidly diminished in size on removal of excessive ingestion of Vitamin A. Unfortunately no biopsy specimen of these enlarged livers has ever been reported.

6. LIVER FUNCTIONS.—With widespread indiscriminate use of potent vitamin preparations in vogue at the present time, one would expect vastly greater incidence of this syndrome than would be evident from the paucity of reported cases. The explanation for this is twofold: lack of recognition of many of these cases, and an individual intolerance to Vitamin A by those children who develop the syndrome. The capacity of the liver to store Vitamin A in normal individuals in enormous and thus the body's tolerance to Vitamin A is great. It is thought, however, that the Vitamin A hepatic storage mechanism in these individuals is impaired. This is aptly illustrated by the brother of this patient, 6 years of age, who ngested the same dosage of Theragran(F) capsules over the same length of time, and yet failed to develop hepatomegaly or any signs of hypervitaminosis A.

Nevertheless, in this case, as in all others previously reported in which the liver studies have been performed, no consistent damage to any specific hepatic function has been demonstrated.)3) Sulzberger and Lazar(2) postullated hypoprothrombinemia in their adult case, but did not report a prothrombin determination. In this case the prothrombin time was normal.

It has been suggested that impairment of the hepatic Vitamin A storage mechanism may be demonstrated by performing a Vitamin A tolerance test. The Vitamin A tolerance curve performed on this patient shows considerable elevation. Only two reports of Vitamin A tolerance tests have previously been presented on these patients.(3) In one instance the curve was normal, and in the other elevated.

SUMMARY

1. A case of hypervitaminosis A is reported, the first such instance recorded in an older child. The toxicity in this case is apparently milder than in others presented.

2. The outstanding features in this case were hepatomegaly and a discrete excoriated macular skin rash. It is urged that hypervitaminosis A be considered in the differential diagnosis of hetatomegaly.

3. A discussion of distinctive features of this case, particularly relative to hepatic function, is presented.

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*Valuable assistance in establishing the diagnosis was rendered by T. R. Gregory, M.D.

**Vitamin A blood levels were performed by Laboratories of Harold Wood, M.D. and Good Samaritan Hospital, Phoenix, Arizona.

***The Vitamin A determinations were performed according to the method of Dann and Evelynn. The normal range for this method is 15-60 mcg%.

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BASIC *Science* SEMINAR

PHYSIOLOGY OF MENSTRUATION

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Menstruation is the termination of a sexual cycle in which ovulation is the key point. Throughout the animal kingdom there are impotant species differences in the mechanism of the sexual cycle. Some species ovulate only upon sexual intercourse. In these species a nervous stimulus from the vagina and cervix must apparently reach the pituitary to elicit the gonadotrophic discharge which is essential to ovulation and corpus luteum formation. In other mammals with a seasonal estrus, such as, bats, climatic conditions (especially length and intensity of light) presumably play a corresponding role. In animals with a spontaneous sexual cycle, and these include the majority of mammals, including man, the regulation of the cyclicity appears to be dependent upon the interactions of the pituitary and the ovaries with their specific hormones.

It is with this last group that we are concerned; and, of these only a few of the mammals undergo menstruation. This phenomenon is limited to the human and a few sub-human primates.

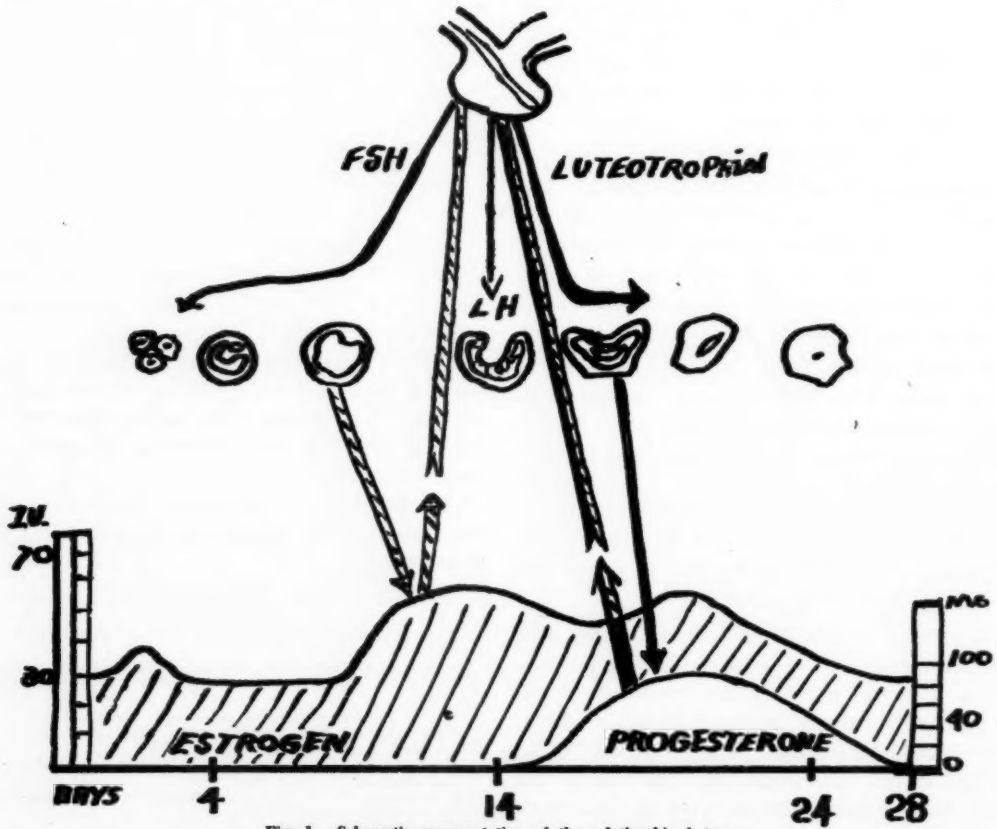

Fig. 1. Schematic representation of the relationship between the pituitary and ovarian hormones.

One can define mentruation as the breakdown and shedding of an endometrium. This is characterized by bleeding from the resulting wound surface. It is normally due to the withdrawal of ovarian hormones from the organism of a female whose endometrium has been first developed by estrogen and then acted upon by progesterone.

There are two endocrine glands and five hormones which control the sexual cycle. The pituitary gland produces three hormones which are designated as: Follicle Stmulating Hormone (FSH) or (Prolan A); and Luteinizing Hormone (LH) or (Prolan B); and Luteotrophin.

The first of these hormones FSH acts upon the ovaries–specifically, upon the theca interna cells of the developing Graafian follicle. The second one, LH, acts upon the ruptured Graafian follicle and causes the development of the lutein cells of the corpus luteum from the previous theca interna cells of the Graafian follicle. Luteotrophin the third hormone from the pituitary may play a role in the maintenance of the corpus luteum.

The ovaries produce two hormones. The theca interna cells of the Graafian follicle produce estrogen; and, the converted lutein cells of the corpus luteum produce progesterone. Estrogen acts upon the endometrium causing growth, vascularization and hypertorophy, and stimulates uterine contraction. Progesterone checks mitosis and growth of the endometrium; promotes function of the glands; and prevents and lessens contraction of the uterus.

There is a fine balance in the quantity and time of appearance between the hormones of the pituitary and ovaries. This can best be followed by considering briefly the mtabolism of the hormones during the sexual cycle. (Fig. 1)

(1) Estrogenic hormone concentration in urine rises from a low after the menses to a peak at about the time of ovulation. This is followed by a slight decline; and, subsequently, by a second premenstrual rise. During the menses, the urinary elimination of the estrogens is hardly detectable.

(2) Pregnandiol excretion (indication of progesterone formation) is negligible during the entire follicular phase, but rises gradually after ovulation to a peak at the middle of the luteal phase. It falls to a low level a few days prior to menstruation.

(3) Gonadotrophins are only present in negligible amounts during the entire cycle except at ovulation time.

(4) Testoids, 17K steroids, and corticoids remain at about the same level during the entire cycle.

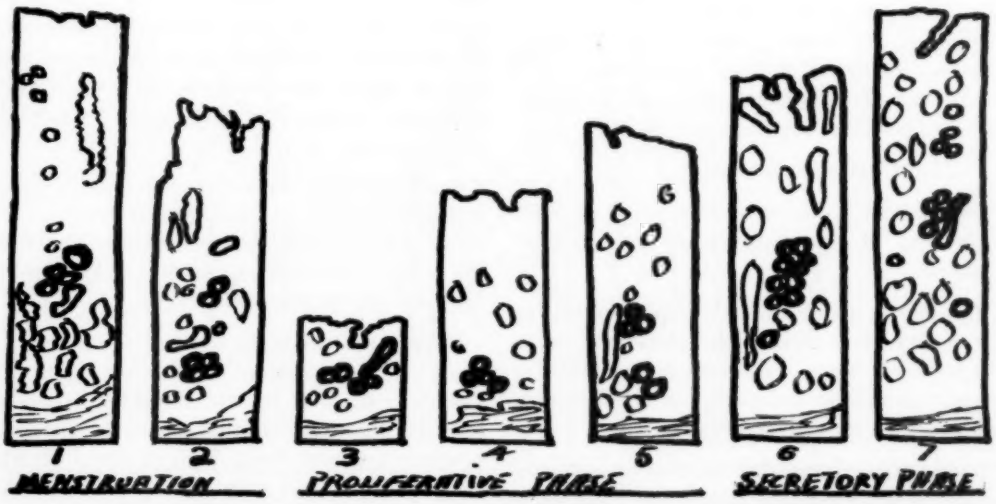

Fig. 2. Line drawings showing location of endometrial plands and arterioles seen in sections of the endometrial rhesus monkeys. (1) first day of menstruation; (2) second day of menstruation; (3), (4) and (5) early and late proliferative stage; (6) midsecretory phase; (7) Premenstrual endometrium.

Concerning corticoid activity Smith reports a drop in the serum diastase premenstrually and it is thought that this reflects increased adrenal activity. Davis reports that there is a consistent fall in the circulating eosinophils at ovulation; and, that the counts remain lower during the luteal phase in comparison to the follicular phase. Whether these truly reflect increased adrenal activity still awaits clarification.

It is seen that estrogen is present throughout the cycle; and, progesterone, only during the last half of the cycle. These two hormones act upon the endometrium of the uterus resulting in specific histological changes. The sexual cycle can, therefore, be divided into various phases depending upon the histological picture of the endometrium. (Fig. 2) The usual division given is:

(1)Follicular phase

The glands are convoluted and corkscrew-many mitotic figures. The stroma is dense. The height of the endometrium is 1 mm. thick.

(2) Early luteal phase (secretory endometrium)

The glands are convoluted and corkscrew-like in appearance. The height of the mucosa is increased. The stroma is deciduous.

(3) Late luteal phase (premenstrual endometrium)

Glands are highly developed and convoluted. Height of the endometrium reaches the maximum of 5 mms. Some 24 to 48 hours before menstruation takes place, there is a regression of the endometrium and the height is decreased to approximately 3 to 4 mms.

(4) Menstrual endometrium

Only the basal layer of the mucosa remains. The rest of the endometrium has desquamated.

The above is the usual description given of the endometrium during the menstrual cycle. Due to recent work in the field of chemical histology, the location and control of cellular enzymes will soon have to be added.

Wislocki has shown that alkaline phosphatase is encountered irregularly during the sexual cycle in the cervical glands and the surface epithelium of the cervix; acid phosphatase is present throughout the cycle.

Atkinson has shown that during the phase of endometrial proliferation and the early secretory phase, alkaline phosphatase activity is great. During the late secretory phase, there is a marked reduction in enzyme activity. Premenstrually there is little or no enzyme activity. In ovariectomized mice treated with various steroid sex hormones, estrogen has been established as the controlling hormone. Both the appearance and quantity of the enzyme responds to the quantity of estrogen administered. These studies localized alkaline phosphatase in the endometrium and established its hormonal control; however, they do little to elucidate its function in the physiology of the uterus.

Estrogen has numerous morphological and physiological effects on uterine tissue. One of the most striking of these is the promotion of endometrial growth especially marked during the proliferative phase of the menstrual cycle. Since growth processes are generally accompanied by increased protein synthesis, the concomittant increase in alkaline phosphatase suggest a functional relationship between the two. Similarly, the appearance of the enzyme and the deposition of glycogen with the disappearance of the lipoids may be a significant relationship.

Meyer has shown a direct relationship between progesterone formation and the quantity of succinic dehydrogenase and alkaline phosphatase that is present in lutein cells of the corpus luteum. He also shows that adenosine tryphosphatase might play a role in the maintenance of lutein cells. All these enzymes function ultimately in providing a favorable intrauterine environment.

Since menstruation is the termination of a normal sexual cycle in which fertilization has not taken place, it has been first necessary to discuss the various component factors which control and take part in the sexual cycle.

There are two main theories regarding the cause of menstruation. One based upon the vascular pattern of the endometrium. The other is based upon the fact that menstrual discharge contains a potent toxin. Both of these theories state that hormonal withdrawal is the activating factor percipitating menstruation.

First we will consider hormonal withdrawal

as the precipitating factor. The observation that corpus luteum regression coincided with menstruation was largely responsible for the assumption that menstruation is precipitated by loss of some substance or substances secreted by this structure. However, since both estrogen and progesterone are secreted by the corpus luteum, it could be either one or both of the hormones.

That estrogen withdrawal was the cause of menstruation was suggested by the observation that bleeding followed bilateral oophorectomy when neither ovary contained an active corpus lutem. Also the menstrual bleeding that takes place in an anovulatory cycle favors the estrogen theory, for here nothing but estrogen has acted upon the endometrium.

The fact that bleeding can be induced in a castrated female by treatment with estrogen and then abruptly letting the level fall to the so-called bleeding threshold, favors the assumption that estrogen is the controlling hormone. However, this theory has been questioned for estrogen is formed throughout the cycle and is present in large amounts in the body fluids. In spite of this, menstruation takes place. Furthermore, during protracted estrogen therapy administration in the macaque, one or more bleeding episodes occur despite a constant supply of estrogen.

The role of progesterone is difficult to evalate; for, before it can be effective, the endometrium has to be prepared by estrogen. There is a natural antagonism between the two; for, estrogen promotes mitosis and progesterone promotes function. One or the other must dominate the cells.

The fact that progestrone can delay bleeding whether or not the mucosa has been subjected to estrogen; and, that large doses of estrogen fail to delay menstruation, when given during the luteal phase, seems to imply that progesterone withdrawal is the key hormone.

Another point in support of the progesterone theory is based on the results obtained by Wat-

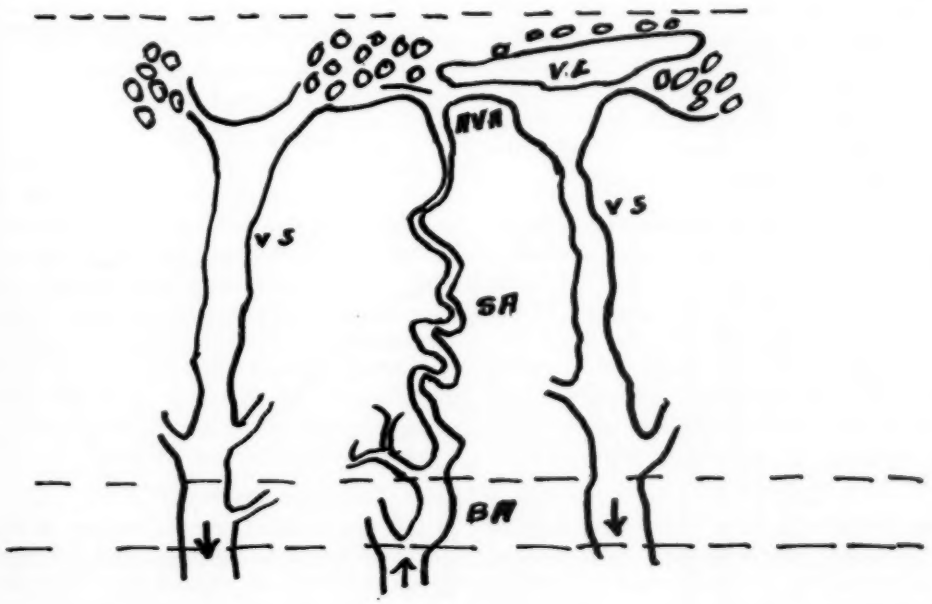

Fig. 3. Diagrammatic representation of the vascular pattern of the human endometriam, according to Okkels, Schlegel and Dalgard.
Legend: VL—venous "lake"
AVA—arteriovenous anastomosis
VS—venous collecting stems

son and McHenry. They injected a castrated monkey with estrogens and followed this by progesterone. The bleeding which followed was associated with necrosis which was limited to the epithelium of those glands fully activated by progesterone and to the stroma surronding them.

The above observations indicate that the menstruation which takes place in a normal sexual cycle is due to progesterone withdrawal; and, to a lesser extent, estrogen withdrawal.

Before considering the vascular theory of menstruation, one must realize that the amount of bleeding varies from the microscopic bleeding of some species of New World monkeys to the profuse hemorrage of the human. Unlike the human, the species with microscopic bleeding do not possess coiled or spiral arteries. The amount of bleeding that takes place varies with the vascular structure of the endometrium. This in turn being a difference in species which has evolved through the needs of the various organisms in furnishing a suitable endometrial bed for nidation. Thus, in the human, a bed with a rich blood supply is needed and developed for the growth of the invading fetal chorion. A complex vascular structure is furnished and when fertilization does not take place, it is dismantelled and rebuilt for the next ovulatory period. With the dismantelling, menstruation takes place.

The vascular theory of menstruation is based on the fact that menstruation is fundamentally a vascular phenomenon in which the endocrines play an underlying role. The anatomy of the vascular bed, and the fact that the blood vessels are responsive to regulation of a specfic nature favor such a theory. A summarized description of the generally accepted views of the static angiology of the endometrium follows. (Fig. 3).

From the radial arteries of the inner third of the myometrium, the endometrial spiral arteries arise. They pursue a coiled course all through the endometrium. They give off very few branches in the mucous membrane and they fork out near the surface epithelium into terminals which in turn dissolve into capillaries of the superficial layers. The outer diameter of the spiral arteries is between 50-100 microns; their walls are from 15-30 microns thick. Basal arteries are given off from the spirals near the myo-endometrial border zone. They branch out in a dichotomic manner and they supply the basal layers of the endometrium.

The veins from a glandular and interstitial plexus. In the functional layer, sinus-like distentions are formed from which venous stems proceed parallel to the glands. These stems run at a certain distance from a corresponding spiral artery. They empty their blood into the larger plexus of the myo-endometrial border zone.

A more detailed study of the endometrial blood vessels, phase for phase, during the complete cycle is given below. It is taken from Hasner's *The Vascular Cycle of the Human Endometriur.*

(1) Early proliferative phase

In this phase, the spiral arteries reach the surface. The arterial wall is thin; the calibre is small. There is rapid proliferation of glands and stroma. The proliferation of the arteries is less pronounced. The capillaries run parallel with the surface. A development of intestitial and glandular capillary networks is in evidence. The veins, too, run parallel with the surface. They unite into venous stems—taking a course at right angles with the surface.

(2) Late proliferative phase

In this phase, the spiral arteries increase in length. They reach the surface epithelium; and, here, they may turn and, for a short distance, run parallel with the surface. Adventitial tissue and whole columns are formed consisting of a coiled artery with its surrounding connective tissue. The capillary bed is now definitely built up as a glandular network. The important feature of this phase is, however, the veins. The venous stems dominate the picture. Their number increases. The walls become thicker.

(3) Early secretory phase

In this phase, spiral arteries increase in length and their terminal branches are coiled slightly. Lower down in the endometrium, the arteries become intensely coiled. Around the arteries and columns of connective tissue, the stroma assumes a loose and edematous structure. The capillaries show some distention with resulting stretching of the endothelium. The veins are even more distended and larger venous stems dominate the picture. There is a reduction of the glandular plexus and a number of sinus like expansions may

be found. These develop into venous lakes whose vascular wall is very thin because of the stretching.

(4) Late secretory phase

In this phase, the edema of the stroma is extensive. The arterial walls are now reduced and their coiling decreases. The spiral arteries undergo degenerative changes. The endothelial cells are swollen. In the capillaries, also, the endothelial elements are swolen. Permeability of the capillary wall is effected because exudation of fibrin is observed around the capillary tubes. A similar degree of exudation is found around veins. Infiltration by numerous leucocytes and plenty of blood extravasates are in evidence in superficial layers. Venous lakes are still further developed.

(5) Menstruation

The spiral arteries during menstruation must be considered separately according to the state of endometrial desquamation. In the desquamated parts the spiral arteries jut out from the lacerated surface, but they are closed by a small covering clot. In the nondesquamated regions the arteries are less coiled, their outer diameter is reduced, and in places show circular con-

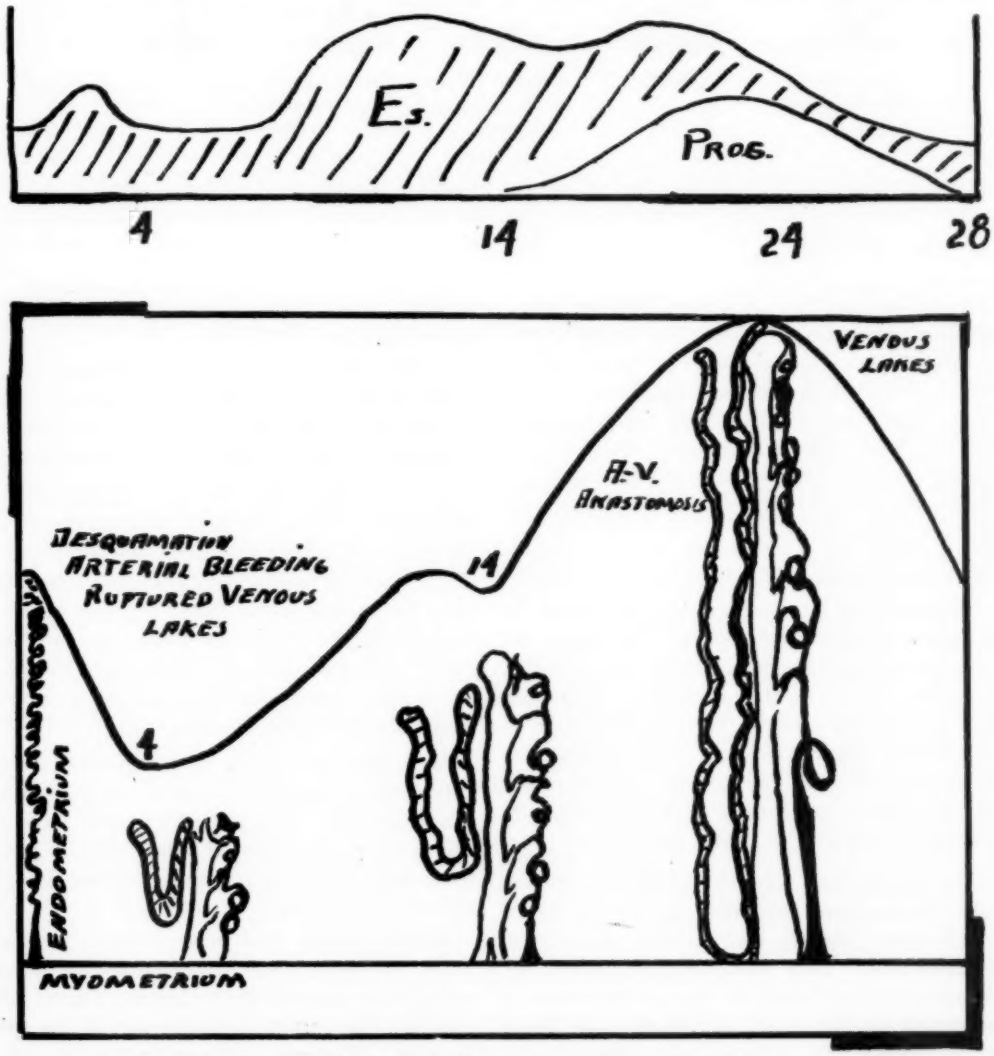

Fig. 4. Schematic representation of the relation of cyclic vascular changes in the uterus to the chief hormonal factors with which these are associated.

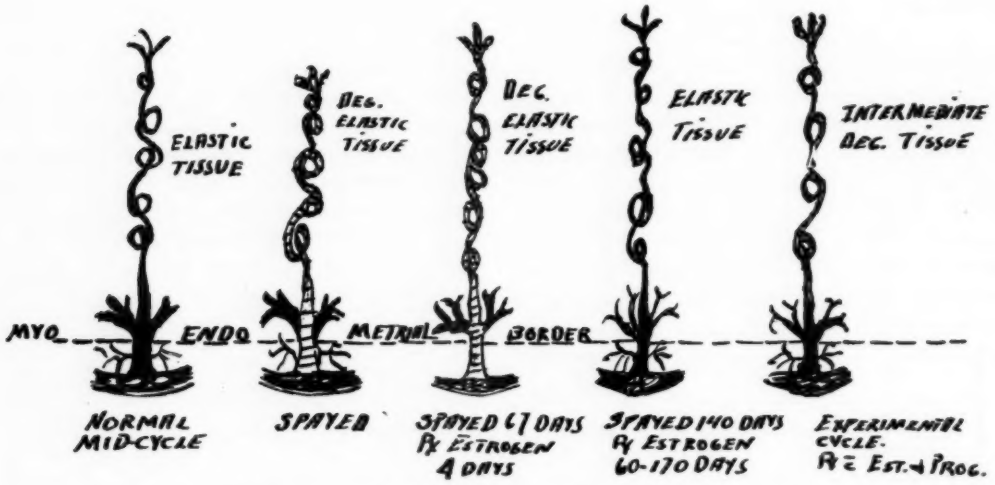

Fig. 5. Schematic representation of the different susceptibility of the uterine arteries and arterioles to prolonged estrogen deprivation. The cross hatched areas signify fibroelastoid hyaline degeneration of elastic connective tissue. Note that only the coiled and radiate arteries are affected and that prolonged treatment with estrogen is necessary for restoration of the elastic tissue. Based on the work of Okkel sand Eagle.

traction bands. The capillaries during menstruation show extreme distention in the entire superficial layer. Here, again, the vascular walls show endothelial swelling and degenerative features. Numerous capillaries open into uterine cavity. Analogous findings are made in the venous plexuses. Here the vascular walls are profoundly altered with necrobiotic phenomena in many places.

(6) Regenerative phase

Characterized by disappearance of edema in remaining parts of the stroma. The spiral arteries have a typical coiled aspect and they still reach the surface. The adventitial layers are once again well defined. The capillary walls in regeneration are well defined. The endothelium is budding off new cell groups. There is reduced capillary congestion. All over the surface epithelium quickly covers the lesion.

The outstanding point is the degree of vascular degeneration and the rapidity of repair which takes place in the vascular tree of the enodmetrium. That this can be caused by changes in equilibrium of the sex hormone is suggested by the work of Okkels and Engle which shows that arteries are responsive to estrogen depravation. Local specific metabolic products have to be considered as a causative factor. (Figs. 4 and 5).

It has been observed that menstruation is preceded by a period of superficial ischemia of the enodmetrium, and the effects of this ischemia upon the vessel structure have to be considered.

It is assumed that the immediate cause of the vascular alteration must be something that affects local circulation; and, thereby, leads to disturbances of nutrition and oxygenation. These may be caused by a local anemia or by a specific metabolic product which may be formed locally as a result of changes in the rate of blood flow. Such local disturbance may also be caused by hormonal disequilibrium.

According to Markee, the regression of the endometrium causes increased coiling of the spiral arteries. This in turn, causes increased resistance to the flow of blood with resulting stasis and vasodilation; thereby causing the local ischemia observed.

Keiffer reports that venous hearts with valvular and contractile modifications of venous walls is the cause of the ischemia. Daron states that it is the result of constriction of the spiral arteries. Westman believes that it is due to myometrial activity with increased contractions

resulting in stasis and venous congestion. Schlegal and Dalgard believe it to be due to the arterio-venous anastomosis with a bypassing of a superficial capillary bed.

Certain facts do not substantiate the assumption that superficial ischemia is the key factor in menstruation. One of these is the observation that vasoconstrictor substances fail to induce menstruation. The other is the failure of castrated monkeys to menstruate when receiving a constant supply of estrogen, despite an ischemia of the entire uterus which was produced by ligating both ligaments.

Reynolds, Wislocki and Dempsey have observed that the lymphatic drainage is very scant in the upper layer of the endometrium, and that this leads to an inability to properly carry away the exudation. This results in congestion and ischemia. This is true for those primates which do not depend upon the coiled arteries for their menstruation. More work has to be done on this theory, for it is a rather recent observation.

The theory of menstruation which is advocated by the Smiths maintains that a menstrual toxin causes menstruation. They state that the proper shedding of endometrium takes place when the toxin effectively causes explosive deterioration of endometrium and occurs only when estrogen and progesterone are withdrawn. Investigation has shown that the toxic factor is an atypical euglobulin. This factor is present in the blood stream during menstruation but not between menstruation. They maintain that the menstrual toxins cause generalized tissue and pronounced vascular damage.

However, Menkin has reported on a toxic factor which he calls "necrosin." Necrosin was developed by irritating the peritoneum of dogs with turpentine. It has a very close similarity to the menstrual toxin; for, serum of a rabbit immunized against the menstrual toxin precipitates canine "necrosin" and vice versa. Apparently, they are identical protein factors. Thus, the menstrual toxin is more likely to be a nonspecific reaction to necrosis—the result of necrosis and not the cause of it in menstruation.

After considering the physiology of menstruation, two basic facts stand out: (1) that estrogen and progesterone build up the endometrium (2) That, with withdrawal of these hormones all structural elements of the endometrium disintegrate.

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PHOENIX *Clinical* CLUB

MASSACHUSETTS GENERAL HOSPITAL CASE NO. 17492

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

An American chauffeur of thirty entered on April 28 in coma, the history was given by the wife.

On April 25 he "caught cold." The next day he felt ill. On April 27 he had blurred vision. After working only a few minutes that morning he was brought home and went to bed. He complained of headache and of tingling, first in the left foot and arm, later in the whole left side, then in the right arm. He complained of severe pain in the back, then became comatose, frothing thick mucus from the mouth at first. He had several severe chills during the first part of the night and was stuporous all night. His wife thought he was not paralyzed. He moved his left leg. In the morning his condition was much worse.

His father and mothed both died of tuberculosis. There is no history of familial disease.

The past history is negative except that for the past six months he had slept all the time when not working or eating, and had been unusually irritable and rude.

Clinical examination showed a desperately sick man in extreme respiratory distress and deep coma. The skin was pale, hot and moist. The mucous membranes were moderately cyanotic. There were blisters on both ankles. There was very marked pyorrhea and dental caries. The respiration was very rapid. The chest was filled with bubbling rales, with slight impairment to percussion and distant breath sounds at the left base. The heart and abdomen were normal. The muscles of the right hand showed atrophy. All the reflexes were hyperactive. There was Babinski on the left and slight poorly sustained bilateral ankle conus. The pupils and fundi were normal.

Urine examination showed a specific gravity of 1.035 and a large trace of albumin at one of two examinations. Blood examination showed 31,800 to 17,200 white cells, 90 per cent polynuclears, 4 per cent eosinophils, hemoglobin 80 per cent, reds 5,000,000 smear normal. The carbon dioxide combining power was 51 per cent. A Hinton test was strongly positive.

The temperature was 104.5° to 109°, the pulse 115 to 122. The respirations were 37 to 35.

X-ray examination showed the diaphragm normal in outline. The lung fields were clear. There was some prominence of the lung markings.

The visiting physician noted, "The breathing suggests laryngeal or tracheal obstruction. He will develop some sticky sputum by cough and then breathe more easily for a bit. The lungs are resonant throughout, without bronchial breathing anywhere. The tracheal noises are transmitted everywhere. . . . Lumbar puncture was discussed and decided against as in a moribund patient an unjustifiable procedure."

A throat consultant found no evidence of membrane or follicular spots in the nose, throat, pharynx or larynx. here was a profuse amount of mucopus brought up from the bronchi. The upper tracheal rings showed reddening only. There was no evidence of tumor or vocal cord paralysis.

A surprising factor in the case was the rapid and extraordinarily deep respiration, suggesting acidosis, which was not present.

The patient went rapidly downhill from admission. Oxygen tent, intravenous glucose and supportive treatment were without result. The temperature rose steadily to 109°. The patient died of respiratory failue on the afternoon of admission.

DR. C. B. WARRENBURG:

A summary of the history and physical of

case no. 5 that we are considering today is as follows.

An American chauffer, age 30, entered the hospital one morning in coma and died that afternoon. He had been ill only 3 days. His illness began with a cold. The following day he felt rather sick and the second day of his illness, he noticed blurring of vision, and after working only a few minutes, he was brought home and put to bed. His complaints then were headache, tingling in the left foot, left arm and later in the whole left side, and then in the right arm. He complained of severe pain in the back, and then became unconscious; frothing thick mucous from the mouth. He had several chills during the first part of that night and was stuporous all night long. His wife thought he was not paralyzed because he moved his left leg. The morning of the day of admission he was much worse.

His mother and father both died of tuberculosis.

The patient's past history is negative except that for the past 6 months he has slept all the time when not working or eating and has been unusually irritable and rude.

Examination of the patient revealed a desperately sick man in extreme respiratory distress and a deep coma. The skin was pale, hot and moist. The mucous membranes were moderately cyanotic. There were blisters on both ankles. The respiration was very rapid and the chest was filled with bubbling rales and there were distant breath sounds at the left base. The heart and abdomen were negative. The muscles of the right hand showed atrophy. All reflexes were hyperactive. There was a positive Babinski on the left and a slight, poorly sustained bilateral ankleclonus. The pupils and fundi were normal.

The urine showed a specific gravity of 1.035 and a large trace of albumin on one examination. The blood showed 31,800 to 17,200 while cells; 90% polys; 4% eosinophiles; Hb 80% with 5,000,000 reds. The smear was normal. The CO_2 combining power was 51%. A Hinton test was strongly poistive. The temperature was 104.5 to 109. The pulse, 115 to 122. The respirations were 37 to 35.

X-ray examination showed the diaphragm normal in outline. The lung fields were clear. There was some prominence in lung markings.

The patient would develop sticky sputum and after coughing would be able to breathe more easily for a short while. The suggestion of tracheal obstruction was present. The lungs were resonant throughout without bronchial breathing anywhere. The tracheal noises were transmitted everywhere. Lumbar puncture was discussed and decided against, as in a moribund patient an unjustifiable procedure. A throat consultant found no evidence of membrane or follicular spots in the nose, throat, pharynx or larynx. There was a profuse amount of mucopus brought up from the bronchi. The upper tracheal rings showed reddening only. There was no evidence of tumor or vocal cord paralysis.

A surprising factor in the case was the rapid and extraordinary deep respiration suggesting acidosis which was not present.

The patient went rapidly down hill from admission. Oxygen tent, intravenous glucose, and supportive treatment were without results. The temperature rose steadily to 109° and the patient died of respiratory failure on the afternoon of admission.

This patient obviously had an acute fulminating infection of some sort and the brain and its meninges are apparently the seat of the infection. Some of the prominent symptoms in this case point to the chest and it is noted that large amounts of muco-pus are brought up. In one part of the protocol, it is noted that moist rales are present everywhere. Later on examination of the chest reveal no moist rales according to the protocol. Oddly enough, x-ray of the chest revealed no abnormalities. It is understandable, however, that with respiratory rate of 35 or more a proper x-ray of the chest may be well nigh impossible.

The patient's illness began with an acute upper respiratory infection and rapidly developed into a fatal illness. The symptoms and findings with a few exceptions are classical for a Waterhouse-Friederickson Syndrome. However, those few exceptions make such a diagnosis questionable. The exceptions are, first, the temperature rise as high as 109 is unusual in a fulminating meningo-coccemia, and second, the absense of rash which is very characteristic of this disease. But

the rapid onset with cold, the coma, the characteristic blood count, and the fatal ending make it necessary to give such a diagnosis consideration.

A tuberculous meningitis may under rare circumstances present a picture similar to this patient. However, the only suggestion of tuberculosis is that both parents died of the condition, and there is no evidence that our patient ever had the disease. We must consider the fact that the history in this case, however, is probably extremely unreliable because the patient was unable to present any of it himself due to his coma. All material in this protocol was obtained from the history as given by the wife.

The patient had a strongly positive Hinton test and although this may be the so called "red herring" because people can die of other things while having syphilis, it is also true that syphilis can mimic any other disease. It is felt that if a spinal fluid test had been run, the diagnosis would be clear in this case and it is difficult to understand why a spinal tap was not done, even though the patient was moribund. Because the symptoms were obviously meningeal a spinal tap with the release of increased spinal fluid pressure may very well have improved the patient's condition, at least temporarily.

In considering this patient's past history, we find one very important fact, namely, that for the past 6 months, this patient has had personality changes and somnolence to an extreme degree. These are suggestive of chornic brain degeneration. On physical examination, atrophy of the muscles of the right hand were found. This also suggests chronic central nervous system involvement. I am sure that if this patient could have given a clear, lucid history himself, the diagnosis would be far more obvious than it is at the present moment.

Meningovascular neurosyphilis is an involvement of the membranes and the vessels of the nervous system by the treponema pallidum with or without secondary involvement of the nervous parenchyma. The symptoms of this disease vary greatly according to the location and extent of the lesion, the relative severity of the meningeal and vascular changes, and the extent of the pathological process.

In a period beginning 6 months to a year after the primary stage, severe meningovascular disasters including meningoencephalisis occur with relative frequency. The meningitis may be either cerebral or spinal. A palsy of one or more of the cerebral nerves may develop which is fleeting and disappear in a few days or may be permanent. Headache, dizziness, and visual and auditory symptoms are often noted. The vascular disorders of this condition are the most dreaded complication of the early period. Thrombosis of one of the large meningeal or cerebral vessels is not infrequent. The sylvian and lenticulostriate arteries are particularly susceptible to this lesion. This results in a hemiplegia. These apoplectic conditions often come without warning or on the contrary, the patient may awake after a few days of headache and dizziness to find himself paralyzed. The paralysis is the result of a destruction of brain tissue due to shutting off of blood supply. Although this condition usually develops during the first 5-7 years after infection, the syphilitic patient is susceptible to such manifestations of meningovascular syphilis throughout life. Although the prognosis of this condition is better than that of any of the other types of the disease, no general statement can be made because there are so many different manifestations of the condition and the changes vary so greatly in the different stages.

It is our feeling that this patient had a chronic meningovascular neurosyphilis with a breakdown of some sort that gave the acute fulminating meningitis that ended in his death within 3 days. The rupture of an aneurysm of one of the cerebral vessels is a very distinct probability and would fit in with this picture as presented. But in addition, the pathological examination of the brain must undoubtedly show evidence of chronic brain damage. The second diagnosis is acute fulminating meningococcemia or the Waterhouse-Friederickson Syndrome.

CLINICAL DISCUSSION

By Maurice Fremont-Smith, M.D., Tracy B. Mallory, M.D. and Arvid Lindau, M.D.

Notes on History

Dr. Fremont-Smith: Pneumonia sometimes has an onset of extreme rapidity, so that the patient is well in the morning and by night is in coma.

I suppose it is quite possible that the coma is due to a sudden increase in intracranial pressure, i.e., meningismus. I do not know whether it is always due to that or not. It may also be due to the toxin of pneumonia.

The blurred vision that came on the day before he was taken here is of course a very important symptom. We associate it with nephritis or with increased intracranial pressure.

Of course we may be dealing with a cerebral accident; the sudden onset and the blurred vision make one think of that possibility. There we have tingling and numbness, first in the left foot and arm, later on the whole left side, which makes one think of a right cerebral lesion behind the motor area in the sensory area. We find it later in the right arm. That gives us a good deal about localization. It requires a hemorrhage that is very large to involve both those areas. Of course we are dealing with the brain. We know we are not dealing with cord alone because he has cerebral symptoms. A lesion on one side of the brain is compatible with life. Where we have disturbances of both sides it implies that the lesion extends over the brain from one side to the other. Usually under those conditions the hemorrhage is so great that it causes death. Consequently we hesitate to say cerebral hemorrhage here. If this is a vascular accident it is more likely to be thrombosis, although there again we have the same difficulty. The thrombosis must be a very large one. We will ask Dr. Mallory whether thrombosis could involve the sensory areas on both sides.

Dr. Mallory: It hardly seems possible.

Dr. Fremont-Smith: This man is thirty years old. He is very young for either hemorrhage or thrombosis. So I am so far quite in the dark.

He had severe pain in his back, besides the other symptoms. Perhaps the best way to put that all together is to conceive of a meningitis of sudden onset with increased intracranial pressure, with blurring of vision, with involvement of the cortex of the sensory area. Yet of course with meningitis headache is usually far more prominent than backache. In mild meningitis such as we see in poliomyeltis sometmes the patient has more back pain than head pain.

The frothing of mucus might imply that the ninth and tenth nerves were involved or it might be due to difficult in swallowing mucus resulting from the fact that he was so comatose that normal stimulus to deglutition was not effective.

This whole picture of the present illness could come from another type of vascular accident, that is subarachnoid hemorrhage. Subarachnoid hemorrhage comes on in early youth, even at the age of fifteen. The onset is very sudden usually, more sudden than in this case, although I suppose one could conceive of a small leak. Almost always subarachnoid hemorrhage begins with severe headache and stiff neck; later if the hemorrhage is large enough there are signs of increased pressure resulting in coma, sometimes death—and sometimes recovery.

There is one thing I have learned through personal experience and that is that one has to be very careful in draining the spinal canal in subarachnoid hemorrhage. One does a lumbar puncture and finds bloody fluid with increased pressure . One should lower the pressure, but not too much. A very good rule is to bring it down one-half, and six hours later bring it down one-half what it was the second time.

His father and mother both died of tuberculosis. Could this be tuberculosis. No tuberculous meningitis begins as suddenly as this. The characteristic onset is very slow. In a child there is usually lack of appetite, some headache and change in character. The child is not very sick at first. Then gradually over a period of days or a week or two the picture becomes more definite. This is not the picture of tuberculous meningitis, and I cannot think of any other form of tuberculosis which this could be. Could he be suffering from one of the other causes of coma? We have spoken of nephritis. That still has to be kept under consideration. Could it be diabetic coma? I do not know of any facts on which to base the diagnosis. In diabetic coma pain, headache and blurring of vision are not characteristic. I should say they do not occur.

For the past six months the patient had slept all the time when not eating and had been unusually irritable and rude. That gives us a hint. Evidently this trouble did not start three days before admission; it started six months ago. We can very easily fit that in which the present

picture, supposing he had a tumor, and supposing that was growing very slowly and giving very little evidence of its presence. We all know that a tumor can grow to large dimensions in a silent part of the brain causing no symptoms. The first symptom may be a sudden attack of convulsions. When we see a patient with sudden onset of convulsions one of the things to think of is brain tumor. Or there may be a period of rapidly increasing coma. What happens under those circumstances? Either there is hemorrhage into the tumor or the tumor presses on some area which prevents the normal flow of spinal fluid, resulting in sudden increase in intracranial pressure. This is not an acute meningitis. I may very well be a picture of tumor with sudden hemorrhage or blocking.

I should like to know more about his respirations, whether they were Cheyne-Stokes in character or whether they were very deep and full such as on might find in acidosis.

The skin was hot and moist. The skin in diabetic coma is dry. The skin of an insulin shock patient is wet.

Those blisters on both ankles mean nothing to me. Has anybody any suggestions?

A Student: Perhaps he had had mustard plasters.

Dr. Fremont-Smith: Marked pyorrhea and dental caries mean nothing in connection with this, and very little anyway, because one finds so many people who have them.

One would not expect very rapid respiration with increased intracranial pressure. That makes us think again of pneumonia. When we get pneumonia with extremely rapid respiration and air hunger we can give a poor prognosis. I have gone out to get a nurse for a patient breathing that way and have come back to find him dead.

The bubbling rales in the chest, percussion impairment and distant breath sounds at the left base may mean something or they may mean very little.

"The muscles of the right hand showed atrophy". I wonder if he was left-handed. I do not see how we can fit that in with any condition we are considering. Atrophy, if it is due to a central nervous system lesion, is due to a lesion of the peripheral neurons, to a lesion in the anterior horn cell or peripheral nerve. If this is a lesion of the head there is no possible place in the brain cortex or in the internal capsule or anywhere above the anterior horn cells that can give atrophy. Syringomyelia hits the anterior horn cell by pressure from the inside of the cord, so that we get atrophy because the anterior horn cells are thrown out. We get the same thing in poliomyelitis and in amyotrophic lateral sclerosis. We are far above the anterior horn cells if we are dealing with a brain lesion. That atrophy is also unexpained.

Of course we should not expect hyperactive reflexes with atrophy. If hyperactive reflexes are due to a central nervous system lesion and not to strychnine poisoning or other toxin or simply to the nervous make-up, they must be due to something above the anterior horn cells. We must postulate a lesion in the cortex, intimal capsule or pyramidal tract. So those two things, atrophy and increased reflexes, do not go together.

With the slight poorly sustained bilateral ankle clonus we have another reason for feeling that there is an injury to the pyramidal tract. Where is it? It cannot be in the cord alone because then we should have no cerebral symptoms. If it were in the cord one might easily have bilateral symptoms. A little compression in the cord can give bilateral symptoms, but in the head it is more difficult to get them. If we assume it is in the head we have evidence that it is chiefly on the right side because of the tingling of the left foot and arm. Why the fundi were negative it is hard to say if you assume increased pressure except that where there is increased intracranial pressure it takes time, sometimes a number of hours and sometimes a few days, before the disks become choked.

The specific gravity of the urine was 1.035. He probably had not been drinking much water during the last twenty-four hours. At one examination there was a large trace of albumin; at the other examination there was no albumin. I do not think we have to explain that on the basis of a kidney lesion. We get albumin often without any kidney lesion.

I do not know whether or not to place any reliance on the strongly positive Hinton test. I should like to. If we can it brings up one other possibility, that is an acute luetic menin-

gitis. Of course it would strengthen our feeling that he may have had a subarachnoid hemorrhage, although most subarachnoid hemorrhages are not luetic, not caused by luetic aneurysms. Has he luetic meningitis? The acute part of the disease is very acute for this disease. Of course the lumbar puncture is going to help us and I think it is fair to wait for that. Has any one of you looked up the clinical course of luetic meningitis?

I am going to base my diagnosis simply on the past history. We do not know whether the history is correct or not, but if it is true that he has been changing in character and has slept all the time when not working, that must mean something. I am going to say brain tumor.

CLINICAL DIAGNOSIS
(From Hospital Record)

Pyrexia of unknown origin.
Brain abscess.

DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Brain tumor.

ANATOMIC DIAGNOSIS

Luetic meningitis and encephalitis.
Acute influenzal pneumonia.

PATHOLOGICAL DISCUSSION

Dr. Mallory: I am not quite sure I know the whole story of this case.

We found two definite and I think entirely independent lesions. One of them was a chronic type of infection of the meninges and brain substances with a good deal of perivascular infiltration of plasma cells pretty well scattered throughout the brain substance. Lesions of the same type were found in the meninges as well, though here we found some scattered polynuclears also. There was, however, no true acute meningitis.

The other striking feature of the case was the lungs. All five lobes of both lungs were greatly enlarged, extremely edematous and hemorrhagic. No lobe was entirely consolidated and yet no lobe was of normal consistency. A great many alveoli appeared in gross to contain a hemorrhagic, very thin fluid exudate. On gross examination I did not feel sure whether it was pneumonia or not. When it came to microscopic examination we found that throughout the lung there was a hemorrhagic and serous exudate in the alveoli; almost no leukocytes, no fibrin. The alveolar walls showed a pecuiar hyalin necrosis which is very characteristic of and I think probably pathognomonic of the so called influenzal pneumonia. This man died last April. During a period of four weeks then we had five cases with this same type of pneumonia. There were no cases in the preceding twelve months and there have been none since. Clinically there was typical influenza in the city at that time.

Cultures from the lung showed non-hemolytic streptococcus and no influenza bacilli. I had expected that we should at least find a hemolytic streptococcus.

Blood cultures and cultures from the meninges were negative. Dr. Kubik felt that the brain lesions were probably those of a chronic, slowly progressive luetic meningitis. They certainly antedated by weeks or months the acute pulmonary elsions.

I think we have to make two diagnoses, luetic meningitis and encephalitis with acute influenzal pneumonia as the terminal event.

Dr. Fremont-Smth: It is interesting that the x-rays showed nothing at all in the lungs.

Dr. Mallory: I should expect that from the appearance of the lungs at autopsy. Every lobe was involved and yet no area was really consolidated. There was none of the thick fibrin and leukocytic infiltration one gets in pneumococcus pneumonia.

A Student: Was there any lesion in the brain that would account for the high temperature?

Dr. Mallory: No single definite lesion certainly. I should be a little inclined to connect the temperature with his influenzal pneumonia rather than with the meningitis, which was apparently a chronic affair and had not really troubled him much until this last illness. One very atypica thing about it was his white cell count, if it really was influenzal pneumonia. A white cell count of 30,000 is very unusual.

Dr. Fremont-Smith: What would lumbar puncture have shown if it had been done?

Dr. Mallory: I think it would have shown a few lymphocytes. There was very little exudate in the subarachnoid space, none in gross, only on microscopic examination.

Dr. Lindau: I wonder if there were any hemorrhagic lesions. That is most usual in influenzal encephalitis. We have hemorrhagic lesions giving the well-known and easily recognized picture of purpura cerebri at postmortem. In certain epidemics as many as 30 per cent of the cases have been complicated with encephalitis (Schmorl). That is much more common complication than meningitis. About six months ago I had a section on one case in which the patient died so suddenly that we suspected he had been poisoned. I found hemorrhagic encephalitis and influenza too. There were only slight changes in the lungs. There is no correspondence between the changes in the lungs and those in the brain, because often I think the infection is so heavy and virulent that it does not stop in the lungs but we immediately get brain changes and the patient dies in a few days.

STATEMENT ON COMPULSORY HEALTH INSURANCE BY GOVERNOR EARL WARREN OF CALIFORNIA

Governor Earl Warren of California, speaking on a CBS radio broadcast on November 4th, again advocated the enactment of a system of Compulsory Health Insurance.

Warren, three times defeated in efforts to inaugurate such a system in California, made it clear that he now favors a system of Government-directed Medical Care for all the American people.

The Governor denied that his program was Socialized Medicine, but the plan he has advocated in California closely parallels the program of Socialized Medicine advocated by President Truman and Federal Security Administrator Oscar Ewing.

The full text of Governor Warren's statement follows:

"It is not sufficient to say that America has developed the finest medical care in the world, even though this is true. We still must find a way to make it accessible to all of our people.

"The well-to-do can pay for good medical care; the indigent receive it from public agencies and through the charitable work of the doctor; but the self-reliant worker, the man in the average or lower income bracket who contributes so much to building our country, and whose greatest ambition and hope is to raise a good American family, cannot bear the financial catastrophe of serious illness.

"I have advocated for California a program of pre-paid medical care as a possible solution. The proposal has been called socialized medicine by some who are opposed to it. It even has been given the ugly name of communism by others. It is neither. Nor is it statism as practised in Germany or socialism as practised in England.

"I have never been and am not now in favor of socialized medicine. I do not believe in socialism, but I do believe in social progress, which has been the hallmark and the glory of the American nation from its beginning.

"I am convinced we will enter upon a new era of progress in the cause of health when we make it possible for every one of our people to protect himself and his family from the economic disaster of backbreaking hospital and medical bills.

"I believe it is the responsibility of the states to undertake to help doctors, hospitals and the public they serve in the solution of what, up to the present time, has been an insoluble problem. I have never held out my proposal as the only solution. It is my proposal until someone offers a better one.

"I am firmly of the belief, however, that our American system is sufficiently adaptable to make possible the solution of the problem of medical care without doing violence to the political, economic or professional concept of all the people who are sincerely interested in the problem."

FROM SECRETARY LULL'S LETTER

A survey conducted by the New York Times a few days ago showed the great expansion program in the history of medical education, to cost $250,000,000, is now underway in this country.

The Times surveyed 80 medical colleges and 48 state commissioners of education through questionnaires.

According to the survey, medical colleges will spend, within the next few years, $50,000,000 for laboratories, $30,000,000 for classrooms and $20,000,000 for dormitories. Another $100,000,000 is earmarked for research and special projects. In addition, the immediate cost for establishing new medical institutions will run above $50,000,000, making an over-all expansion program of a quarter of a billion dollars.

"To meet the increasing demands for more physicians and medically-trained men," the Times said, "at least 10 states have taken steps to build new medical schools or expand their two-year basic science schools into four-year institutions.

"In the current academic year—1951-52—the medical colleges admitted the largest freshman classes in recent history, a total of 7,381 . . . Despite the expansions now taking place, large numbers of qualified applicants are unable to gain admittance to any medical college in this country. Many of them seek places in foreign institutions. The records indicate that 20,000 individuals applied for admission to American medcal schools for the current college year. As many of them applied to more than one institution, the total number of applications was more than 70,000, or an average of 3.5 a student."

A.M.A. NEWS NOTES

NOTE TO EDITORS:
AMA News Notes makes its premiere bow this month. This new monthly publication will carry up-to-date stories on what's going on around your AMA.

President's Health Commission Requests AMA Cooperation—A request for "cooperation" on the part of the American Medical Association in making various health and medical care statistics available to the President's Commission on the Health Needs of the Nation was approved by the Board of Trustees.

Dr. George F. Lull, Secretary and General Manager, officially replied to the Commission, saying: "It has long been the policy of the American Medical Association to permit all survey and study groups to have access to the medical data in its possession. The Board's action, however, should not be construed as implying approval of the Commission or its projected program which we believe to be of political intent."

Gundersen Elected To Hospital Rating Post—Dr. Gunnar Gundersen of Wisconsin, a member of the AMA Board of Trustees, recently was elected chairman of the Joint Commission on Accreditation of Hospitals. The Commission recently selected Edwin L. Crosby, M.D., as Director.

California Group Plugs PR Plaque—Pushing PR in its territory, the California Medical Association is attempting to lick the problems of patient-doctor misunderstanding at the grass roots. In a mailing to all its members, the California Medical Association is offering to provide every physician in its organization with a plaque, "To All My Patients," for display in his office. This plaque, designed by the AMA, urges patients to feel free to talk over questions regarding professional services and fees. Although the AMA is selling the plaque at one dollar a copy, the California society is underwriting the cost for its own members in an effort to gain wide circulation of the plaque. So far, more than 5,000 of California's 16,000 physicians have requested plaques.

(Continued on Page 58)

THE *Secretary's* MESSAGE

A GOOD DOCTOR IS A GOOD CITIZEN

THE PHYSICIAN WHO CONSISTENTLY FAILS TO ATTEND HOSPITAL STAFF MEETINGS, OR WHO TAKES NO ACTIVE PART IN THE AFFAIRS OF HIS MEDICAL SOCIETY, IS HARDLY IN A GOOD POSITION TO CRITICIZE EITHER THE HOSPITAL OR THE MEDICAL SOCIETY. BY FAILING TO MAKE HIS VOICE HEARD, HE MUST SHARE THE BLAME FOR ANY FAULTS, FAILURES OR DEFICIENCIES.

LIKEWISE, THE PHYSICIAN WHO FAILS TO *REGISTER* AND *VOTE* IS NOT IN A GOOD POSITION TO COMPLAIN ABOUT CORRUPTION, TAXES OR GOVERNMENTAL POLICIES WHICH HE FINDS OBNOXIOUS. BY FAILING TO FULFILL ONE OF THE VITAL DUTIES OF CITIZENSHIP, HE MUST SHARE THE BLAME FOR ANY BLACK SPOTS IN THE AFFAIRS OF THE COMMUNITY, THE STATE OR THE NATION.

THE RIGHT TO *REGISTER* AND *VOTE*, WHICH IS BOTH A PRIVILEGE AND A DUTY IN A NATION OF FREE MEN, WAS NEVER MORE IMPORTANT THAN IT IS RIGHT NOW. FUNDAMENTAL ISSUES WHICH TRANSCEND THE USUAL PARTY POLITICS, AND WHICH WILL AFFECT THE FUTURE OF EVERY AMERICAN, CALL FOR A CLEAR-CUT DECISION BY THE ENTIRE VOTING POPULATION. BE SURE THAT YOU PLAY YOUR RIGHTFUL PART IN THAT HISTORIC AMERICAN DECISION.

TO BE A GOOD DOCTOR – FIRST BE A GOOD CITIZEN. *REGISTER* AND THEN *VOTE*. AND OF EQUAL IMPORTANCE, SEE THAT YOUR FAMILY DOES LIKEWISE.

Editorial

ARIZONA MEDICINE

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CONTRIBUTORS

The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. (See MEDICAL WRITING by Morris Fishbein.)
3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.
4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.
5. Submit manuscript typewritten and double-spaced.
6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

The Editor is always ready, willing, and happy to help in any way possible.

POLICIES AND PROCEDURES ADOPTED BY THE DEPARTMENT OF DEFENSE IN IMPLEMENTING PUBLIC LAW 779, 81st CONGRESS

At the outbreak of the Korean incident, the only source of physicians and dentists available to the military services, other than those already on duty, was the reserve components. At that time the rolls of the active and inactive reserve components of the Army could not supply sufficient medical and dental officers, particularly in the junior grades. Only a very small number of medical and dental ASTF participants had enrolled in the Army Reserve. The Navy, on the other hand, was in a much better position because the majority of the medical and dental participants in the V-12 Program were members of the Naval Reserve. The Air Force was in a position similar to that of the Army, with the expection that it was not an independent department during World War II and, therefore, had not sponsored an educational program.

To insure an adequate number of physicians and dentists to meet military requirements, Public Law 779 (the Doctor Draft Act) was enacted. Under its provisions members of reserve components were specifically exempted from registration by the following:

> "Section 4i(1) . . . No such person who is a member of a reserve component of the Armed Forces shall, as long as he remains a member thereof, be liable for registration and induction under this subsection, but nothing in this subsection shall be construed to affect the authority of the President under any other provision of law to call to active duty members and units of the Reserve Components."

The effect of relieving members of reserve components from the obligation to register exempted all participants of the Navy V-12 Program, who were members of the Navy reserve component. This comprised a large group of physicians and dentists who would have been members of the Priority I group if they had not been so exempted. Further, in the Section quoted, specific authorization to call reserve personnel to active duty is reaffirmed and this is interpreted as indicating the intent of Congress that members of reserve components be so utilized at the discretion of the President.

Extensive and earnest study was given to the most equitable and satisfactory method of bringing physicians and dentists to active duty from the increased sources that became available after the enactment of Public Law 779. It was believed, and it still is believed, that the interests of all concerned are best served by the program which was adopted and which has been

followed. It consists of assigning a priority classification, paralleling that of Selective Service, to all reserve medical and dental officers which they would have had under Selective Service had they not been exempt from registration and then calling them to active duty in accordance therewith. Thus, Priority I type reserves which includes Priority I registrants who have indicated a willingness to accept commissions are called up before Priority II's are called. It permits the Navy to utilize its reserves who were obligated to serve and it insures that the Army and the Air Force will have sufficient personnel. It also has the advantage of reducing to a minimum the necessity of actually drafting doctors by affording those who are vulnerable the opportunity of accepting commissions rather than having to face the stigma of being inducted involuntarily.

As the plan has operated, the Navy up to the present time has filled its requirements from its reserve components. The Air Force, with few exceptions, has had a sufficient number of requests for commissions and voluntary applications for extended active duty from Priority I registrants to meet its needs. Except for one month, July 1951, the Armed Forces has been able to fill its requirements for physicians by involuntarily ordering to duty Priority I registrants who have indicated a willingness to accept commissions.

You are well aware of the advantages to the interests of the national welfare in having the local and State Advisory Committees of the Selective Service System advise the military departments on the essentiality of reserves destined for calls to duty. This arrangement has proved its merit and the departments have cooperated with it in a satisfactory manner even though the obligation to do so in the cases of reserve personnel is not prescribed under the provisions of Public Law 779.

It is true that there are some recalcitrant Priority I registrants who refuse to accept commissions and are escaping duty as long as a sufficient number to meet the requirement do volunteer. Their number, however, is relatively small. According to Selective Service statistics for January 31, 1952, of an original 10,785 Priority I living registrant physicians, 1,094 remain immediately available; and of an original 3,928 Priority I registrant dentists, 620 remain immediately available. Since January 31, 1952, the available Priority I dentist pool has been reduced by the induction calls for 335 dentists in April 1952 and 175 dentists in May 1952.

When all Priority I type reserves have been called to active duty, or deferred for acceptable reasons, the Selective Service System will be requested to bring the remaining Priority I registrants into service before any Priority II type reserves are called up. It is anticipated that this will occur within the next six months; hence, the recalcitrant ones are only delaying their service until all the Priority I registrants who have accepted commissions are called up. It is a matter of opinion whether this is to their advantage. If the military emergency should cease to exist before they are inducted, they will have escaped military duty. On the other hand, if the emergency continues, they will be forced to come into service at a later date and will have to serve after their more willing contemporaries are returned to civilian life and become reestablished in their practices.

It has been the desire of the Department of Defense to comply with the intent of Public this has been done to the best interests of the Law 779. It is believed that as far as practicable individuals and of the Armed Forces.

TOPICS OF *Current Medical* INTEREST

RX, DX, AND DRS.

By GUILLERMO OSLER, M.D.

The pressure for supplies of the INH drugs (isonicotinic acid hydrazides) for treatment of tuberculosis is tremendous. Hoffmann-LaRoche and Squibb are besieged by institutions, physicians, and patients for even a few pills. . . . As of April first there is almost none at large except that released to the VA Hospitals, and that which has leaked out FROM them. . . . The materials are supposed to be used strictly for research until the FDA gives approval, and a signed application for this purpose is required. The need for control and data is far greater than usual because of the premature outbreak of stories about the drugs. . . . Squibb is talking very 'poor' about the amount of supplies. H.-LaR. is optimistic. The Schering and Nepera companies have crowded in on the act by offering millions of pills to any applicants (the newspapers say), but later.

INH NEWS ITEMS,—The first cloud on the horizon is the statement that weak dilutions of INH in cultures can produce that bugaboo 'resistance' . . . The JAMA editorial reports that the drugs are bacteriocidal, rather than bacteriostatic—but several good bacteriologists say they are the latter. . . . Dr. Sevringhaus (of H.-LaR.) says that Marsilid is toxic in animals, but is less toxic than Rimifon in humans, and perhaps more effective.

The cleverest recent idea in medical education is the suggestion that FUNDS FOR MEDICAL SCHOOLS be obtained by using the income from doctors' medical discoveries. It has been approved by the AMA Board of Trustees. . . . This would fill a need for funds; it would avoid leaning on the guvmint; and it would make ethical the criticized but richly successful Wisconsin Alumni Research Foundation.

Dr. Clarence Kroeger, once assistant to Dr. Lewis Howard of the Tucson City and (Pima) County health departments, has changed California jobs. . . . Dr. Kroeger has made history as health officer in the tough Imperial County territory. He is now to become assistant health officer for Mendocino County, where a full-time department has just been established.

A good clinician must never become tolerant or unaware of physical ABNORMALITIES, even among his friends or acquaintances, else he will fall on his face and no longer be a good (upright) clinician. . . . He must continuously inspect, rather than look at, the color, expression, movement, posture, etc., etc., of all those with whom he comes in contact. . . . It should be a pleasure as well as a habit, or he should take up some such remote and localized specialty as proctology.

H. C. Wood Jr. of Philadelphia suggests that hospitals save money and serve food in better condition by having small DINING-ROOMS FOR AMBULATORY PATIENTS. There probably are reasons against the idea, but there are several others in its favor. . . . Where Dr. Wood jokingly suggests a bar to help pay expenses, we would add the charitable use of a slot-machine. (Result, e.g.,—"St. Elmo's Hospital builds a new wing without campaign for funds"!)

An Arizona angle is visible in the recent report to the American Academy of Dermatology and Syphilology by Sulzberger and Hermann of N.Y.U. . . . They have found that the reason for relief from asthma, arthritis, certain skin disorders, etc., which occurs in warm dry climates is THE EVAPORATION OF PERSPIRATION. . . . Serious systemic disorders can result from a malfunction of the sweat glands in humid weather. It is like a failure of the radiator in a car. . . . Dr. Sulzberger is worth listening to, since he is a very sharp dermatologist and author.

It was suggested here many months ago that a substitute arm would be a great help in training nurses (and internes and residents) in the obscure talent of GETTING A NEEDLE INTO A VEIN. . . . Now comes a report in 'Hospital Topics' of such an arm, made from a mould, containing a network of latex rubber, 'veins', and covered with a vinyl resin 'skin'. . . . The veins are constantly filled with a red liquid from a bracketted syringe, and students can palpate, aim at, and possibly hit the tubes under expert guidance . . . we suggest a post-graduate hour on 'arms' with a quarter inch of cotton padding, making it feel like 10 per cent of the real arms seem to.

The most fashionable 'SMOOTHAGE' FOR CONSTIPATION has recently been methyl cellulose preparations. They haven't always seemed to be the perfect material which the authors claimed. . . . Now Cass and Wolf report in 'Gastroenterology' that psyllium seed is a better laxative than other types. Thus it comes back full cycle to us old-fashioned people.

THE WALTER REED CENTENNIAL brought out many stories of the conquest of yellow fever and of the life of Dr. Reed. Some of them have to do with Arizona. . . . A few weeks after his marriage in April 1876, Reed journeyed from Tennessee to the southwest. His wife joined him in October at San Diego, and they travelled east in 22 days to his doctor's post at FORT LOWELL, Tucson, by doherty wagon (a military stage-coach

drawn by 4 mules). . . . The following August they were sent "by the shortest usually travelled route" to FORT APACHE, in the White Mountains. He was responsible for the health of the troops, as well as that of the settlers for miles around the post. . . . Their only child, a son Walter, (later to become a military hero and Inspector General of the Army) was born at Fort Apache. Dr. Reed left the west in 1880 for Fort Ontario, Oswego, N. Y.

A news-letter from Bauer & Black tells of seven general hospitals in Massachusetts and Texas with UNRESTRICTED VISITING HOURS. . . . It is said to work, but such a status is hard to imagine. It could be called a change from bedlam to chaos.

The non-psychiatrists among us may not know of a PROGRESS IN NARCOANALYSIS. It seems that the barbiturates may be accompanied by desoxyephedrine with good effect. . . . The patients tend to be both relaxed and alert. Material is more readily and quickly available when the combination is used. The barbiturate dosage need not be so carefully controlled and the patient remains conscious. The amnesia for the interview does not occur and the patient's recall makes the interview continuously valuable.

A macabre but useful vehicle is described by G. R. Knopf, in answer to a question by Dr. E. M. Bluestone in 'The Modern Hospital.' The question, —How to Camouflage a Corpse. . . . The answer is to use a double-deck cart. The body is put on the lower level, the top level is unused, and the entire cart is covered by a large sheet. . . . The vehicle can be wheeled thru the corridors, into elevators and lobbies, or wherever transit is needed, without the depressing effect caused by the usual cart.

One would think that chemists in general would feel a little silly about a reversal of one of their pet theories concerning oxidation. . . . It has long been accepted that paint becomes dull and chalky because of a combination of the lacquer or enamel with oxygen in the air. Now it seems that the process may be due to REDUCTION—or would you rather hear about the simple mechanism of atomic energy?

Typical of the confusion which exists as to WHAT AND WHEN THE PATIENT SHOULD BE TOLD ABOUT HIS ILLNESS is the article by Gallinek in the New York State Journal of Medicine. . . . He believes that the diagnosis of multiple sclerosis should generally not be revealed to the patient—yet it should be treated. . . . A needless paradox, we say. . . . Tell him of his disease, since he has to live with it. Send him to Southern Arizona, since it allows a safer life. Treat him with the best medical methods, as indicated. Let him work and be adjusted and happy—he is no worse off than thousands of others with an uncertain future.

A small obstruction to MEDICAL WRITING has been moved a bit, at least in Washington, D. C. . . . The 'Medical Annals' of D.C. describes a 2-day Conference on Teaching Techniques. It will give help on various aspects of medical writing, illustration, etc. . . . Such a course was once given by the Milwaukee, Wisconsin, Medical Society.

Do your patients complain of being 'let down', a lack of courage, a lack of fecundity? It figures, according to the SUNSPOTS. . . . Evidence is available on the sunspot cycle for hundreds of years. The cycle is 11.2 years long, and depends on the number of spots which appear. When sunspots are scanty, your patients will complain of symptoms which fit with those named in the first sentence. . . . There was a decline during World War II; there has been a long 'high' since 1946; there is a falling index in the past year, and the effects should be noted in the next few years. . . . These data come from Santa Clara University, the Tree Ring Laboratory in Arizona, the Zurich and U. S. Naval Observatories—and a California tax survey.

(Continued from Page 48)

Rural Health Makes News—More than 500 medical and farm leaders gathering in Denver for the Seventh Annual Conference on Rural Health made news. The Conference's theme—how to help rural communities help themselves to better health—was carried not only in many newspapers and magazines but also to a large radio audience in the Denver area and throughout the midwest.

Over 35 different radio programs—arranged by the Colorado State Medical Society and the AMA Public Relations Department—were broadcast. Tape recordings of the entire Conference are being edited down into six 15-minute programs entitled. "Help Yourself to Health," which will be available to medical societies from the AMA's Bureau of Health Education.

AMA Delegates To Attend Elementary Education Meet—Dr. Walter B. Martin, Trustee, and Fred V. Hein, Ph.D., Bureau of Health Education, will represent the American Medical Association at the Sixth Annual Conference on Elementary Education. Conferees will examine problems connected with improving elementary education programs when the group convenes April 30 and May 1-2 in Washington, D.C.

Hospital Financing Survey Gets Under Way In North Carolina—The Commission on Financing of Hospital Care recently completed a series of preliminary meetings in San Francisco, Tulsa, Cincinnati, Cleveland, Boston and St. Paul designed to point up the problems involved in financing hospital care. The Commission, an independent citizens' committee stimulated by the American Hospital Association and financed by grants from the Kellogg Foundation, Health Information Foundation and John Hancock Life Insurance Co., plans to initiate its survey in North Carolina.

'52 Funds Approved For Medical Education Survey—A $39,650 budget to wind up activities of the Committee for the Survey of Medical Education has been approved by the AMA Board of Trustees. The Committee reports that Survey findings should be completed and sent to the publisher by June, 1952.

A representative sample of 41 medical schools was studied with the idea of pointing up the basic problems facing medical education today. Broad objectives of the Survey are: (1) to improve medical education to meet over-all health needs of the public; (2) evaluate the degree to which medical schools are meeting the need for physicians; (3) promote the advancement of medical science, and (4) inform the public of the nature, content and purposes of medical education.

AMA To Set Up Socio-Economic Files.—The AMA plans to centralize its medical socio-economic files in the near future. At its last meeting, the Board of Trustees authorized the appointment of an assistant librarian to assemble and catalog this material from the various councils, committees and bureaus of the Association. Eventually a complete history of AMA policies and attitudes will be compiled from this source.

AMA Group Acts As Liaison With Legion—The AMA Board of Trustees recenty appointed a liaison committee of Doctors Elmer Henderson, chairman, Perrin H. Long, George F. Lull, Henry B. Mulholland, Harvey B. Stone and Walter B. Martin, to confer with the American Legion on matters dealing with national health and medical care problems. On March 1, this group met with the American Legion's Committee on Rehabilitation in Washington, D.C. The committee will meet again in April with Legion representatives.

AMA Pays $20,000 In '52 For Chronic Illness—The AMA has pledged continued financial support to the Commission on Chronic Illness in the amount of $80,000 to be paid over a four-year period. The Commission, an independent national agency, is conducting an intensive study of chronic illness—one of the most important health problems in America today. This year's installment of $20,000 was recently turned over to the Commission. A $300,000 budget set by the Commission for the coming four-year period has been met by twelve contributing organizations.

New Health Education Series Aired—A new series of health education radio programs, called "Medicine, USA," are being carried over the National Broadcasting Company network on six successive Saturdays—the first on March 29. Sponsored by the American Medical Association and county medical societies in cooperation with NBC, the shows are broadcast from New York at 7:30 p.m., EST.

Subjects include: March 29—"Alcoholism;" April 5—"Psychiatry;" April 12—"Longer Life;" April 19—"Contagious Diseases;" April 26—"Exercise and Athletics," and May 3—"Medicine's Progress."

Woman's AUXILIARY

Left to Right: Mrs. Joseph Bank, County Public Relations; Mrs. John R. Green, State Publicity; Mrs. Jefferson Brown, Chairman State Board of Nursing; Mrs. Thomas W. Woodman, President Maricopa County; Mrs. Muriel Crothers Henry, Director of Public Relations on National Committee of Careers and Nursing; Mr. Phil Stitt, Executive Secretary, Arizona Nurses' Association; Mrs. William Schoffman, State President-Elect; Margaret Savoy, Society Editor of the Phoenix Gazette; Mrs. George S. Enfield, County Health Chairman; Mrs. Zona Brierley, Chairman of Joint Careers for Nursing Association; Mrs. Freda Erhardt, State Nursing Board. The Luncheon was in the honor of Mrs. Henry and was held at the Kiva Club atop the Westward Ho Hotel, Phoenix.

REPORT ON THE NURSE RECRUITMENT DRIVE

The Maricopa County Auxiliary to the Medical Society decided after a careful study of possible projects this year, that the one of greatest benefit to the state would be a Nurse Recruitment Drive. Arizona is very much in the debtor bracket as regards fulfilling nursing needs.

With 1700 nurses in the state, we still need a full 500 more to answer our needs. The entire state graduated only 50 nurses last year from some five accredited schools of nursing. This year, we have only four such schools, since the hospital on the Indian reservation no longer operates a school. Were it not for the 600 transient nurses, our situation would be even more critical. Right now, they ease a bad situation, but do not answer the requirements of permanent installations such as schools, hospitals, administrative posts.

Since the various state nurses' organizations were likewise aware of the need, and heard of our interest, they decided to join forces with us. Thus the Arizona State Nurses' Association, and the Arizona League of Nursing Education appointed a chairman to work jointly with me. To Mrs. Zona Brierley I am greatly indebted for her effort and participation in this over-all plan. Each of us had different facets, and contacts which helped to more than widen our approach.

The week opened with a proclamation by Gov. Howard Pyle designating March 23-29 as State Recruitment Week. An intensive period has just concluded, tho it will with less publicity continue since this is not a one-time need. Into the blueprint were incorporated the churches, schools, press, radio and TV.

In the drive three colleges of this area, and eight of the high schools of Maricopa County were contacted, including the colored, technical, Indian, and parochial schools. The two groups bought the movie, "Girls in White", and the Medical Auxiliary, as a final gesture of friendship, at the conclusion of this week is presenting its half to the State Nurses Associations for their use. The schools not only showed the movie to nursing clubs, and potential nurse

recruits, but arranged to show it to science classes, including boys. My own adolescent son was thrilled at seeing the movie in a class, and the word-of-mouth discussion has helped to make young girls lean to added consideration of nursing. The various PTA groups, Mothers Clubs and youth groups have viewed the movie. In one case, it went on in conjunction with a school fashion show, and included in high fashions, *two nurses uniforms.* Thousands literally have seen the movie locally.

The drive extends next to schools in the rest of the county of which another dozen are participating. From these rural areas come many of our best nurse recruits. Two other counties are sending in nine girls from over 100 miles away, sparked by enthusiasm engendered by our state auxiliary as it has spread the word on its visits.

The final phase of the school participation is being undertaken, by Mrs. George Enfield, State Chairman on Health. In addition to helping in the forming of new chapters and strengthening of the outlying smaller ones, she has spread the "gospel" of the need for nurses. As a result, the communities in Pinal and Pima have offered to show the movie through many of their high schools in the month of April.

The churches participated, with over eighteen giving sermons or telling of Recruitment Week in their bulletins, and many asked for a follow-up of the movie and an address by a hospital nurse in their Young Adult groups in evening meetings.

Naturally the keystone of the arch is the hospital with a nursing staff, and teaching faculty, so they were vital to our planning. The three local nursing schools co-operated to the fullest, and we handled an impartial plan in which presented its own aspects of teaching.

The *hospitals* concluded the week with an open house and demonstration of their program. Over 100 girls, escorted by parents or PTA members attended each hospital for two hour periods throughout Sat. March 29th. Hospitals acted as hosts for meals and a tea.

The plan was such a success, with the girls reaching a high point of enthusiasm, and the hospitals so gratified by their interest, that the hospitals themselves volunteered to hold another open house within a month, if a like number of girls evince interest. Thus far, from discussions alone, it seems the quota will be more than filled, for it is increasingly clear, that the best recruit is the younger student with enough time to plan her courses for her career even from eighth grade through junior year. Thus, another hundred girls will probably gather from various counties and the Phoenix area to see a hospital at first hand.

Channels of publicity are a MUST in such a campaign, and this the Maricopa County Auxiliary was most instrumental in getting, and the nursing groups feel grateful to us for this aspect, for they have never before had so many sides of nursing before the public and so explicitly. The enclosed material shows to some degree how far it went in awakening a lethargic public to what was likewise THEIR PROBLEM. The press gave us week day and a special Sunday spread. Thru the week day social columns a profile on nursing a day went on that publicized the school nurse, visiting nurse, practical nurse, hospital instructor, and registered nurse, professionally and service-wise.

An *editorial* in the Phoenix Gazette was followed by the high point of the week, as regards newspaper publicity. Reg Manning, who won last year's Pulitzer Prize in cartooning, did for us the poster *cartoon on nursing needs.* Inasmuch as he does not participate, even for best friends in Red Feather, Red Cross or other agencies, we feel highly honored at his consideration of our needs, and realize his chief reason for doing the cartoon which goes to over 100 other syndicated papers *nationally* (and thus helps the National Recruitment Drive) was based on the fact we were doing altruistic work, not fund-raising!

The various radio stations gave us in all about two dozen spot announcements, and one station ran a series of interviews under the sponsorship of Business and Professional Women ending with an offer spontaneously decided on of a loan fund to a would be needy nurse.

Several department stores were contacted, and gave their support. Two, Goldwaters and Diamonds were exceedingly generous with a window display of nursing. The Goldwater window showed a nurse, and the caps of the three local schools, as in a capping service. Diamonds window showed a nurse lining up a surgical table, with excellent poster display. These likewise gave the Recruitment Drive space in their advertisements by inserting slugs. Several surgical houses also gave us placard space.

It would be well-nigh impossible to close such an account without giving due tribute to the various members of the nursing profession who did so much to make this Drive a success. Miss Jefferson Brown of the State Board of Nurses helped with various aspects of the Governor's Proclamation, and assisted by lending us the movie of the Public Health Service when we needed it to supplement "Girls In White" for two showings in schools in a single day. Miss Dylis Salisbury of the State Examiners' Board helped us in our mailings throughout the state, and the many letters that went out appraising high school principals of our efforts were typed in her office, making literally dozens of copies. Her judgment, too, was invaluable in formulating the approach to press and hospitals. Mrs. Brierley and I were Siamese twins of effort.

The Medical Auxiliary in Maricopa had the great satisfaction of creating an atmosphere of cordiality between itself, the schools, churches and press, hospitals and nurses that has reached a new high in public relations. Each has come to know and value the other in this joint endeavor.

The high point of the publicity was the arrival of Mrs. Muriel Crothers Henry, Public Relations Chairman of the National Committee on Careers in Nursing. She had a radio interview, a luncheon with the press present, and our medical and nursing members present to hear her informative and inspirational talk.

The Maricopa County Medical Auxiliary feels it sparked a program second to none, did a great public service in joining so many agencies in a common effort, and received itself the great satisfaction of a job well done.

Mrs. Joseph Bank, Chairman Recruitment Drive, Maricopa County Medical Auxiliary, Phoenix, Arizona